April 8, 2005

Mr. Marco Gonzalez
Executive Secretary
Secretariat for the Montreal Protocol
P. O. Box 30552, Nairobi, Kenya

Dear Mr. Gonzalez:

The United States submits the attached information in response to the questions provided by MBTOC regarding our 2007 CUE request. We hope this information is helpful to MBTOC in its deliberations, and we look forward to discussing these issues next week.

I would like to take this opportunity to note that the United States has discovered an error in our Nursery Fruit Nut Flower sector nomination. We have revised our total request in this sector downward to a total of 6,485 kg, with corresponding amounts for each of the applicants as follows: Western Raspberry 2,738 kg; CA Rose growers 227 kg; CA Deciduous Fruit and Tree Nut 3,520 kg. We will provide a revised BUNI chart to MBTOC next week reflecting this change.

In addition, the United States recently realized we did not provide additional information related to MBTOC's suggested reduction for 2006 in the eggplant sector. Recognizing that we have missed the deadline to appeal this amount, we are not requesting any additional tonnage in 2006. However, we believe that a higher CUE amount is justified for this sector, and our 2007 nomination is consistent with this view. In order to ensure MBTOC is aware we continue to believe the higher amount is justified, I have also enclosed a document providing additional information and clarification for eggplant for our 2006 CUE. We are not asking MBTOC to take action on the 2006 nomination amount, but we want the information available to ensure with respect to our 2007 CUE that we have not agreed with the MBTOC reduction for 2006.

I hope this information is helpful, and if you have any questions please contact John Thompson (1 202 647 9799 or thompsonje2@state.gov).

Sincerely,

Robert J. Ford
Acting Director, Office of Environmental Policy

US POST HARVEST GENERAL ISSUES

MBTOC reference: OzL./MBTOC-CUN/USA/MS/lm

General Issues

MBTOC QUESTION

The U.S. CUNs do not list the structures to be fumigated, do not give specific and individual volumes, types of structure, location, frequency of fumigation, dosage rate and why each is not suited to use of alternatives. Yet, MBTOC has the job of diligently evaluating if the proposed use of MB is critical for the specific circumstances of proposed use of MB. For example, without this information it is not possible for MBTOC to check volume of structure to be fumigated against the dosage rate and the requested amount of MB. Without this information MBTOC can not determine if SF can be used by a particular structure because we do not know if it is located in a state that allows SF use. We can not determine if heat can be used successfully because we do not know location of the structure or its volume.

These questions were also raised during consideration of last year's CUNs relating to fumigation of structures. MBTOC is concerned that it will be unable to assess the particular circumstances of the individual mills, food processing or similar facilities without this information. MBTOC cannot ascertain whether such an analysis has been carried out in order to provide an estimate of the critical need for methyl bromide in the year of the nomination.

MBTOC can not ensure that there is no double counting of establishments and fumigations by fumigators competing for business from the potentially the same customers. Would it be possible for U.S. to explain to MBTOC or assure MBTOC that there is sufficient oversight to ensure the same facility or structure is not included in more than one CUN or by more than one fumigator company?

US RESPONSE

The US has ensured that facilities are not included multiple times. This has been accomplished by not allowing more than one applicant to include a specific class of facilities. For example, NPMA originally requested methyl bromide for some flour mills. Because flour mills were requested by the North American Millers Association, the entire NMPA request for flour milling was removed from their request. This procedure was followed whenever the same commodity/structure appeared in an application to the USG.

US POST HARVEST COMMODITIES

MBTOC reference: OzL./MBTOC-CUN/USA/MS/lm

MBTOC QUESTION

1. Section 5 says that Eco2Fume is the only chemical alternative available for the treatment of dried fruit and nuts. We assume that other forms of phosphine supply are also allowable. However, MBTOC is aware of the registration of propylene oxide (PPO) for disinfestation of nuts and some other dried commodities in the US. Additionally, the California almond industry has built several suitable chambers and markedly increased its use of PPO on almonds in the past two years (largely in response to Salmonella contamination but the process used to control Salmonella would also be useful for pests). The CUN Table 12.1 page 12 refers to the registration of PPO for in-shell walnuts, but does not inform about the registration for other commodities included in this CUN. Please inform MBTOC of the current registration status of PPO in the US and in California for disinfestation of the dried commodities included in this CUN and reasons for not considering it an available alternative for the various commodities.

US RESPONSE

PPO was recently registered by the U.S. EPA and by California Department of Pesticide Regulation (CA DPR) for use on in-shell and processed nutmeats. As PPO is volatile and flammable, it may only be used in heated (at temperatures of 52 ºC or higher) vacuum chambers. The currently low availability and high cost of these fumigation chambers will limit their widespread adoption. At present, PPO is being used by the walnut industry to sterilize approximately 20% of bulk shelled walnuts sold for dairy and bakery ingredients, targeting primarily mold and bacteria, and secondarily insects.

MBTOC QUESTION

2. What percentage of walnuts is exported to Europe and is there an EU tolerance for PPO residues in walnuts?

US RESPONSE

Approximately 25 percent of walnuts are sold in the shell, and these are usually packed and shipped to European market within a couple of days of the initial fumigation treatment. The USG does not have ready access to the EU importation tolerances requested and the EU would be the best resource to obtain information on their tolerances. The importation tolerance for PPO was not provided in our nomination because we did not believe it was needed to support the case for our CUE.

MBTOC QUESTION

3. Given that registration status and technical issues that might allow or disallow use of a potential alternative shelled versus in-shell nuts, can you give MBTOC the percentage of the nut crop to be MB fumigated that is shelled or in-shell?

US RESPONSE

The U.S. Government does not have precise information as to what proportion of the nut crop is fumigated with MB in-shell and what proportion is fumigated shelled. However, according to the California Walnut Commission and Walnut Marketing Board, and as reported in the critical use nomination request, approximately 25% of the walnut crop is sold in the shell, shortly after harvesting. The remaining 75% is stored until needed for processing. About 30% of the stored walnuts receive a second fumigation before processing. Since 2001, Diamond Walnut, which represents about 50% of the industry in California, has relied strictly on Eco2fume to fumigate stored whole walnuts, whereas the other 50%, mainly small producers, continue to rely on MB for all in-storage fumigation

MBTOC QUESTION

4. Table 6.1 located on Page 8 is incorrect in terms of amount of MB requested and/or volume to be treated or both. Could you please check this, correct it and return a corrected version to us?

US RESPONSE

The corrected table is attached below.

TABLE 6.1: METHYL BROMIDE CONSUMPTION FOR THE PAST 5 YEARS AND THE AMOUNT REQUESTED IN THE YEAR(S) NOMINATED-- CORRECTED

For each year specify:	Historical Use[1]						Requested Use	Requested Use
	1998	1999	2000	2001	2002	2003	2006	2007
Amount of MB (kg)	100,889	119,322	101,954	109,192	102,213	104,704		91,279
Volume Treated (1000 m^3)	3,464	3,445	2,653	2,848	2,723	2,345		2,233
Formulation of MB								
Dosage Rate (kg/1000 m^3)	30.56	30.04	32.21	32.32	32.44	34.31		35.44
Actual (A) or Estimate (E)								

[1] Based on most current information.

MBTOC QUESTION

5. Please explain reasons for variation in amount of MB used in various years as reported in Table 6.1. For example, while we note that the 2007 total requested amount is less than use in 2003, it is more than use in 2002 and 1998 and just slightly less than use in year 2000.

US RESPONSE

The US has corrected Table 6.1 (see question 4 above) and the requested amount is less than the amount of MB used in previous years.

MBTOC QUESTION

6. Why is there an increase in the request for walnuts and pistachios for 2007 over 2006? The CUN indicates that 20% of walnuts are now treated with propylene oxide and other lines of investigation are in progress. Phosphine treatment is available and used for nuts in store and where handling facilities, including temporary storage, allow the longer fumigation period to be applied. Yet increased MB use is nominated. Does this imply the 20% that is treated with PPO is also treated with MB and that there is an increased requirement for methyl bromide in store for some reason? Note that MBTOC understands the need for MB to be used for research and does not include quantities used for research as part of this query.

US RESPONSE

The 2,000 kg increase in the 2007 critical use nomination for walnuts represents the projected production needs for the industry. At present, PPO is used by the walnut industry to sterilize approximately 20% of bulk shelled product in packages sold for dairy and bakery ingredients, targeting primarily mold and bacteria, and secondarily insects. Based on Food and Drug Administration (FDA) requirements, customers demand that bulk walnuts sold for dairy and bakery ingredients be sterilized with PPO. No MB treatment is further required on sterilized product.

MBTOC QUESTION

7. The dosage rate used for walnuts seems to be a mistake. Table 1.9a page 10 indicates a walnut dosage rate of 111kg/1000m3, yet MBTOC believes the highest label rate is 48g/m3. The maximum label rate is higher than the minimum efficient dosage rate for walnuts. Please supply MBTOC with the correct, and minimum effective, intended MB dosage rate for walnuts.

US RESPONSE

MBTOC's observation is correct. The dosage should be 48 g MB per cubic meter (48 kg/1,000 cubic meters), as stated in the walnuts nomination.

MBTOC QUESTION

8. Table 12.2 page 14 footnotes refer to vacuum chamber fumigation of walnuts. What percentage of walnuts is MB fumigated in vacuum chambers and is this the reason for the high dosage rate reported? If so, what is the dosage rate used for walnuts that are not fumigated in vacuum chambers? Vacuum chamber fumigation while faster, uses more MB. Please justify the use of vacuum chamber fumigation for MB.

US RESPONSE

Approximately 62.5% of walnuts are fumigated in vacuum chambers, on arrival. The dosage used for vacuum fumigation is still 48 g MB/m^3. Vacuum fumigation is needed to rapidly process large volumes of incoming walnuts during the peak harvest season. The 5-6 days (7+ days for Eco2fume) that a phosphine fumigation requires, compared to the less than 24 hours that it takes to fumigate with MB, would essentially bring the fumigation process to a standstill during a time when over 1,300 tons of walnuts are being harvested and processed

daily. Even when allowing the minimum of 5 days for phosphine fumigation and one full day for MeBr fumigation under vacuum (which under vacuum only takes about 7 hours), the difference would be 4 days per fumigation. Assuming a peak production/processing season of only two weeks, the downtime would be 4 x 14 = 56 days. However, the peak season is actually 3-4 weeks, which would translate to a downtime of 84-112 days.

MBTOC QUESTION

9. MBTOC would like to know more about the marketing pressures on dried beans. Although the CUN discusses marketing pressures on dried fruit and nuts, including factors as the need for quick fumigation before export and domestic pre-Christmas sales, but this information is not included for beans. Since beans harvested earlier and used later and with less need for quick sales, might there be less need for quick fumigation and thus slower alternatives, such as phosphine, may be suitable? (Table B2, Page 10)?

US RESPONSE

The marketing pressures for Blackeye beans and garbanzos are similar to those of dried fruit and nuts. About 60-90 percent of Blackeye beans are consumed as part of New Years Day celebrations in the U.S. Hence, the main shipment period is during October through early December. During that time, temperatures in northern California are in the 10 ºC – 15 ºC range and it takes a minimum of 36-72 hours to fumigate with phosphine. The peak harvest season for garbanzos is June and July. Fumigation with methyl bromide begins each day at 4:00 pm and is completed by early morning the next day. This system allows processors to keep up with the approximately 90 tons of garbanzos arriving each day at each warehouse during peak harvest season. At the end of two weeks, phosphine fumigation would have created an 810 ton backlog of garbanzos. Blackeye beans are harvested during September through November, with an average of about 90 tons being delivered to each warehouse. As with garbanzos, blackeye beans are fumigated daily, on arrival. Garbanzos and beans are loaded directly into fumigation chambers. The availability of MB allows the fumigation, cleaning, grading, and storing processes to keep up with the large volumes of beans arriving each day during the peak harvest seasons.

MBTOC QUESTION

10. Page 20 and page 22 indicate there are no technically feasible alternatives for dried beans. Is phosphine registered federally and in California for use on dried beans? If so, why is it not considered technically feasible?

US RESPONSE

Cowpea weevil is the principle pest affecting dried beans in California. Although phosphine is registered federally and in California for dried beans, the label does not list cowpea weevil. California has strict policies requiring that the pest to be controlled is listed on the pesticide label. Should the CA Bean Shippers Association apply phosphine for cowpea weevil, they

would be in violation of the label, i.e. it would be an illegal use. Consequently, USG has deemed this to be technically infeasible due to regulatory constraints.

MBTOC QUESTION

11. Table 9.1(a) Page 10 seems to indicate that the reported dosage rates are used regardless of product temperature. Is this correct? Warmer temperatures, as seem likely in California, can allow for lower MB dosage rates. Can you supply MBTOC with information on product temperature at time of fumigation?

US RESPONSE

While Table 9.1(a) on page 10 does provide application rates for methyl bromide, MBTOC is correct in noticing that the rate of methyl bromide is not linked to temperature. Efficacy of methyl bromide, like all fumigants, is influenced by "1) leakage from the structure, 2) sorption, 3) temperature and humidity, 4) size of facility being treated, and 5) location of the pests in relation to the fumigant being released." (Fumigation Guide, Great Lakes Chemical Corporation). That is why most fumigation companies use concentration by time (CT, which is measured in the US by oz. hrs). The Great Lakes Fumigation Guide for methyl bromide has a list of recommended CT for several common insect pests under laboratory conditions, which does take into account temperature. The fumigation companies depend on the CT in all their fumigations, including methyl bromide.

USG has no data relating methyl bromide efficacy to temperature under field conditions. If MBTOC is in possession of such data, the USG would appreciate it if MBTOC sends a copy so that it can be evaluated and used in future assessments

MBTOC QUESTION

12. Table 9.1(b) says no information on gastightness is available. Fumigators conduct gastightness measurements before and during fumigations. For a critical use, Decision XI/6 requires that MB emissions and use are minimized. MBTOC seeks information on gastightness of fumigations to ensure only the minimum amount of MB technically required is used. For this reason, and to ensure due diligence, we need information on gastightness. Failing that, can the US confirm that MB fumigations in this sector will only be conducted in conditions of at least good gastightness (refer to Handbook for definition of 'good gastightness'). If good gastightness is not currently possible, how will gastightness of fumigation facilities be improved this year and what effect is this expected to have on the potential critical quantity of methyl; bromide in this nomination?

US RESPONSE

In order to ensure that only critical uses of methyl bromide are nominated the U.S. has reduced the amount of methyl bromide nominated for post harvest uses to ensure more effective sealing of facilities and more efficient fumigant usage. In addition, the US is currently developing a Reregistration Eligibility Decision for preplant, post harvest and structural use of methyl bromide as part of a comprehensive assessment of all fumigants. As part of that assessment, worker and bystander risk assessments are being conducted. After

the risks and hazards have been evaluated the U.S. will be discussing all methods, including gas tightness, as potential mitigation measures and methods to ensure the safe efficient and effective use of fumigants. The U.S.expects to conclude the reassessment of fumigants during the 2005 or early 2006 calendar year.

MBTOC QUESTION

13. Could the US government inform MBTOC if or when SF becomes registered in California for the uses included in this CUN, likely rate of adoption and the effect SF adoption will have on requested amounts of MB?

US RESPONSE

The USG will inform MBTOC when and if SF becomes registered in California for the commodities for which it has a federal registration. However, USG still will not have information concerning the price of the product, use rates, additional state restrictions, or number of trained fumigation teams in order to fully analyze the impact of the possible registration. The 2008 CUN requests should have an update on this dynamic situation.

US CUCURBITS

MBTOC reference: OzL./MBTOC-CUN/USA/MS/gao

MBTOC QUESTION

1. In this nomination there are differences (in some cases important ones) between the crop areas stated in the CUNs and those used as a basis for the requested amounts- and the official USDA statistics for these crops. For example Michigan does not appear to be an eggplant producer according to USDA´s statistics; or the "*other south-eastern states*", with the only exception of North Carolina. Could the Party please confirm which figures in the nomination are correct and the official source of this information?

US RESPONSE

USDA's statistics do not accurately track states that have small areas of production for a given commodity. Since eggplants are a relatively small acreage crop nationwide, only the biggest producers would be tracked accurately by USDA. However, the USDA Census of Agriculture does give the number of eggplant acres harvested for Michigan and all other states. 400 acres were harvested in MI in 2002. The Census of Agriculture is only done every 5 years, so this is the best available government information that we have. Unfortunately, other sources of information may not have indicated any eggplant production because of the small areas involved. The website used by the USG is available at: http://www.nass.usda.gov/census/

MBTOC QUESTION

2. Could the Party please confirm what data it has used to validate the areas cropped with cucurbits that are affected by Karst geology areas.

US RESPONSE

In most cases the U.S. was unable to match information on Karst geology with growing areas of specific crops[1]. The best available information was used. Where site-specific information was available, it was used. Where such information was not available, the U.S. assumed that all crops grown in the state were independently and identically distributed across karst soils. In other words, the U.S. assumed that the proportion of each crop grown in karst soils was equal to the proportion of that state's agricultural land that comprised karst soils. For Florida, for example, approximately 40% of that State's agricultural land overlays karst topography[2], so 40% of each Florida crop forming part of the US nomination (such as cucurbits) is analyzed as if it is grown in an area overlaying karst topography. Georgia is estimated to have 8% karst topography. Although this procedure may be inaccurate with respect to a specific crop, because it accurately captures the overall proportion of agricultural land and thus agricultural crops where certain alternatives to methyl bromide cannot be used, it will give a correct total picture of methyl bromide need.

[1] The exception is Dade County, Florida. By 1,3-D cannot be used in Dade County so that for purposes of the BUNI analysis, all of Dade County is treated as having karst topography.

[2] With the exception of Dade County (as noted above) which is treated as having 100% karst topography.

US EGGPLANT

MBTOC reference: OzL./MBTOC-CUN/USA/MS/gao

MBTOC QUESTION

1. Experimental results has shown that for the control of Phytophthora on eggplant in Michigan, 1,3 D + chloropicrin is a key alternative with efficacy comparable to MB. According to the CUN, the main problem for its adoption is a potential delay in planting as long as 28 days low soil temperatures. Fumigation operations need to be completed by the first week of May to capture an early market window. In Michigan, Soil temperatures in April vary between 10-15 °C. 1,3 D+Pic can be applied when soil temperature is higher than 5°C as it is the case in Michigan in April. Therefore, can we consider soil temperature as a limiting factor for the soil fumigation with 1,3D+Pic?

US RESPONSE

As noted in the summary section (part 5) of the nomination, soil temperatures in Michigan do not consistently climb over 10°C until after mid to late May (Schaetzl and Tomczak, 2001, listed in the citations in the nomination), and thus neither 1,3-D nor metam products can be used effectively for early eggplant planting in Michigan. The nomination does mention that temperatures in April are in the 10-15 C range, but this is erroneous and we apologize for the error. According to temperature data from Michigan State University's agricultural experiment station (available through its website, www.maes.msu.edu), soil temperatures even at a relatively shallow depth (4 inches) range from a minimum of 3.8 °C to 13.8 °C. Even within this range, temperatures fluctuated down to the minimum frequently, and it was not until mid-May (after May 11) that they remained consistently above 10 °C. While these temperatures are above the absolute minimum (4.4 °C) needed to legally apply 1,3 D, the efficacy of this fumigant is lower at low temperatures. The good efficacy seen in the most promising trials was seen at temperatures between 10 – 15 °C. Given these aspects, and the corrected temperature range for April, USG must continue to ask MBTOC to consider soil temperature as a significant limiting factor for fumigation with 1, 3 D+Pic.

MBTOC QUESTION

2. Important reductions may be obtained by calculating the area with Karst geology where MB can be replaced by Metham Sodium and Pic. What percentage of US eggplant production occurs in Karst geology?

US RESPONSE

In most cases the USG was unable to match information on Karst geology with growing areas of specific crops[1]. The best available information was used. Where site-specific information was available, it was used. Where such information was not available, the USG assumed that all crops grown in the stat were independently and identically distributed across karst soils. In other words, the USG assumed that the proportion of each crop grown in karst soils was equal to the proportion of that state's agricultural land that comprised karst soils. For Florida, for example, approximately 40% of that State's agricultural land overlays karst

[1] **The exception is Dade County, Florida. By 1,3-D cannot be used in Dade County so that for purposes of the BUNI analysis, all of Dade County is treated as having karst topography.**

topography[2], so 40% of each Florida crop forming part of the US nomination (tomatoes, strawberries, peppers, eggplant) is analyzed as if it is grown in an area overlaying karst topography. Although this procedure may be inaccurate with respect to a specific crop, because it accurately captures the overall proportion of agricultural land and thus agricultural crops where certain alternatives to methyl bromide cannot be used, it will give a correct total picture of methyl bromide need.

MBTOC QUESTION

3. In Michigan, the formulation 50:50 has been introduced. What are the constraints to increase the use of this formulation in Michigan and also in Florida and Georgia?

US RESPONSE

The U.S. has not been able to locate sufficient, credible, multiple year studies that indicate that the 50:50 formulation is both technically and economically feasible in the circumstances of the US nomination for eggplants. If MBTOC is aware of such information USG would greatly appreciate receiving the references so that it may be evaluated.

MBTOC QUESTION

4. In some states, e.g. Georgia, eggplant is generally double-cropped with a cucurbit crop (muskmelon, cucumber, or squash). MB is applied every year. The requested quantity can decrease if MB is applied every two years, as it is the case in Michigan. Are there any constraints to adopt this frequency in Florida and Georgia?

US RESPONSE

In the southern and southeastern US, pests include nutsedges that are aggressive colonizers and thus must be controlled every year (i.e. residual effects of fumigants, even with herbicides) do not last across two years. Furthermore, the text in the nomination is erroneous in stating that MB is used once every 2 years in Michigan. It should state that it is used once a year, as it is in the southern US. In Michigan the target pests appear to be ubiquitous (present in virtually all eggplant acreage), hence the need for an annual fumigation there. The BUNI calculations used this annual fumigation as a basis.

MBTOC QUESTION

5. The MB formulation adopted in Florida and in Georgia is 67:33. Could the formulation 50:50 be adopted in these two eggplant producing regions?

US RESPONSE

USG has not been able to locate sufficient, credible, multiple year studies that indicate that the 50:50 formulation is both technically and economically feasible in the circumstances of the US nomination for eggplants. If MBTOC is aware of such information USG would greatly appreciate receiving the references so that it may be evaluated.

MBTOC QUESTION

[2] **With the exception of Dade County (as noted above) which is treated as having 100% karst topography.**

6. The party is requested to explain why no large-plot studies have yet been performed to show commercial feasibility of available alternatives in US eggplants

US RESPONSE

Thus far, it is our understanding that large-plot studies are being planned in all the regions requesting MB for use on eggplants in this nomination, but such studies will begin when funding is secured for the trials (in 2005 at the earliest). US regulatory and research agencies have no legal authority to promote commercialization of alternatives explicitly, and indeed, would be prohibited from making recommendations of any sort until large-scale feasibility of MB alternatives had been demonstrated. USG regulatory agencies must work with fewer tools in this area than most other governments, as the US regulatory system has been designed to maintain more of a separation between private and public entities.

MBTOC QUESTION

7. Will the farm demonstration plots will be implemented in 2005? If yes, please give more details: number, distribution, alternatives etc.

US RESPONSE

Because the USG cannot compel large plot trials, we cannot state with certainty that farm demonstration plots will be implemented in 2005. However, as was stated above, it is our understanding that large-plot studies are being planned for in all the regions requesting MB for use on eggplant in this nomination, contingent on funding and the cooperation of commercial growers being obtained.

To reiterate, US regulatory and research agencies have no legal authority to promote commercialization of alternatives explicitly, and indeed, would be prohibited from making recommendations of any sort until large-scale feasibility of MB alternatives had been demonstrated. As was noted in the text above, this requires completion of such studies by public and private entities outside USG regulatory agencies. USG regulatory agencies must work with fewer tools in this area than most other governments, as the US regulatory system has been designed to maintain more of a separation between private and public entities.

MBTOC QUESTION

8. What are the strategies to be adopted in the near future to reduce the use and emission of MB? etc.

US RESPONSE

USG does not have detailed information at present to provide. Information relevant to this question is being developed as part of the process of developing the US management plan in 2006. The US, like other Parties, will be submitting this plan to the Parties in 2006. Some regions requesting MB for uses in eggplants have outlined research plans to test ways to reduce the use and emission of MB, etc. These plans are described in the nomination in Section 17 for Georgia, and Part D, section 19 for Michigan.

MBTOC QUESTION

9. What is the importance use of HDPE (high density polyethylene) to minimize use and emissions of MB in eggplant production.

US RESPONSE

Currently virtually all eggplant growers using MB utilize HDPE to minimize emissions and amounts used of MB. It is thus of critical importance and is standard practice.

MBTOC QUESTION

10. No reference about grafting on Solanum torvum rootstock is provided. This alternative is widely used and expanding very quickly in the Mediterranean and the Netherlands, as an MB alternative and to increase production. Solanum torvum is fully resistant to fusarium and nematodes, with no problems due to high temperatures. It is used in Central America under very hot conditions. Please clarify the situation in the US?

US RESPONSE

As far as the USG is aware, grafting of *S. torvum* has not been evaluated for commercial feasibility as an MB alternative for US eggplants. USG must point out, in this context, that the pests of critical concern in US eggplant regions requesting MB include *Phytophthora* and nutsedge weeds (in addition to *Fusarium* and nematodes) Unless MBTOC is aware of studies demonstrating efficacy and, equally importantly, commercial feasibility, of using *S. torvum* against these pests as well, USG takes the position that this approach is not yet viable as a MB alternative for US eggplants. USG would also like to point out that although the cost of production of new varieties of rootstock is subsidized in at least some other countries, it would have to be fully borne by commercial eggplant producers in the US. The cost involved is unknown (if MBTOC can provide supporting data on costs of production for the US that would be very helpful).

Double-cropping

MBTOC QUESTION

1. For Florida, Table 11.1 indicates that most, possibly all, of the CUN crop is double-cropped (page 13). Please clarify what percentage of the eggplant CUN area practices double-cropping in Florida. What are the most common rotational crops in Florida? Table 11.1 indicates peppers, cucurbits; whereas page 7 mentions several other crops as well.

US RESPONSE

The proportion of Florida eggplant area that is double cropped is high, probably the majority of acreage in any given year. USG cannot find databases that track the relatively small Florida eggplant acreage in this context (647 ha in 2003 across the entire state). As to the most common rotational crops, they are cucurbits and peppers, as was mentioned in Table 11.1 as the 'typical' rotations.

Citations list (section 26)

MBTOC QUESTION

2. The citations list does not include new research, new communications or other developments since 2003. With only one exception, the citations (including personal communications) in the citations list are dated December 2003 or earlier. Have there been any trials, activities or developments related to eggplant and issues relevant to Decision IX/6 since 2003? If so, please provide information.

US RESPONSE

Based on the literature available to USG (and the study packages submitted with the eggplant CUE requests), there are no studies relevant to the pest complexes of critical importance in US eggplants that are more recent than 2003. However, as was described in section 17 for Georgia, studies on alternatives are planned or underway. Work done in 2004 on MB alternatives in Michigan was described in some detail in the nomination (Hausbeck and Cortright 2004, in the citations section). That work is expected to be continued in the near future as well.

Combination treatments with herbicides

MBTOC QUESTION

3. In Questions sent to the Party on eggplant in June 2003, MBTOC stated that "MBTOC is concerned that much of the research conducted on uses of alternatives is conducted on peppers or tomato and extrapolated to eggplant production, particularly on the impact of nutsedge infestation." Since this is the 3rd year of a CUN request for eggplant in the USA, it is expected that very substantial progress will have been made in research in eggplant by now. Please clarify?

US RESPONSE

As described in the nomination (for example, see Michigan and Georgia sections, in particular section 17), research is either underway and/or planned for MB alternatives. Hausbeck and Cortright (2004) were cited as work done in Michigan eggplants in 2004 on MB alternatives, and this will be repeated in 2005. While large scale, multi-year trials are being initiated and are not yet complete, USG would like to point out that eggplant acreage in the US is considerably smaller than that of peppers or tomatoes, and tomatoes, in particular, dwarf these other vegetable crops in terms of acreage and thus research priority. This is the general reason why work in eggplants has not proceeded further; USG has and will continue to rely on research done in other solanaceous crops only out of necessity.

MBTOC QUESTION

4. The section on Florida (pages 13-20) does not give sufficient consideration to combinations of several fumigants + herbicides/weed control methods. The only fumigant combinations considered in the section on Florida are (a) 1,3-D+ pic (page 13, 17), and (b) 1,3-D + pic + Devrinol + trifluralin (page 15). Although Table C.1 mentions metham with or without pic (page 17) the citation Locascio et al 1997 in fact covers metham alone, therefore Table C.1 relates to metham alone. Please provide information about any other combination treatments, such as several fumigants + herbicides/weed control methods that have been trialled for eggplant in Florida?

US RESPONSE

As noted in the US response to the previous question, eggplant acreage in the US is considerably smaller than that of peppers or tomatoes, and tomatoes, in particular, dwarf these other vegetable crops in terms of acreage and thus research priority. USG was unable to locate studies of the sort described in this MBTOC question, done specifically on eggplants and the US must continue to rely on research done in other solanaceous crops only out of necessity. It is not clear from the text of this question what MBTOC is referring to as regards Florida, as there have been no studies specific to eggplants that were described for that region in the nomination.

As regards other regions, work cited for Michigan is in its nascent stages, and must be repeated at commercial scales to be relied upon. Furthermore, USG believes that the work by Locascio et al. (1997) is relevant for 1,3 D + Pic as that was a treatment specifically included in that study. While Metam with Pic was not a treatment involved, USG has been unable to locate a study showing efficacy comparable to MB for metam, even when Pic is added, when the pests of concern are yellow and purple nutsedges. If MBTOC is aware of such studies, USG would appreciate receiving a copy.

MBTOC QUESTION

5. The CUN for Georgia provides information on several combinations of fumigants (page 25) but does not provide data/information on combinations of fumigants + herbicides/weed control methods. If such combinations have been tested in eggplant, please provide copies of studies or citations?

US RESPONSE

As far as USG is aware, these combinations have not been tested for eggplants. USG believes it is important for MBTOC to keep in mind that a number of potentially efficacious herbicides are either injurious to eggplant or simply not registered for legal use in the US (please see Georgia, sections 13 and 14 for details). USG would like to point out that in addition, the herbicide alternatives mentioned in these sections can only be used in the row middles, and some only provide suppressive control of nutsedge.

Yield loss analysis

MBTOC QUESTION

6. The tables of yield loss analysis for Florida (Table C.1 page 17) and Georgia (Table C.1 page 27) do not appear to be relevant or sufficient. The yield loss table considers only 1,3-D + pic, and metham (alone). (Table C.1 is based only on Locascio et al 1997 (pages 17, 25; Table 16.1 on pages 18, 28) which carried out small-scale trials in another crop (tomato) for 1,3-D+pic, and metham. Although Table C.1 appears to cover metham sodium with or without chloropicrin, the CUN text about the study by Locascio et al (1997) indicates that metham alone was tested.) It is very surprising that by 2005 the CUN does not provide any yield results for eggplant, nor for combinations of fumigants + herbicides/weed control methods, in Florida and Georgia.

US RESPONSE

As was pointed out in the US response to an earlier question, eggplant acreage in the US is considerably smaller than that of peppers or tomatoes, and tomatoes, in particular, dwarf these other vegetable crops in terms of acreage and thus research priority. USG was unable to locate studies of the sort described in this MBTOC question, done specifically on eggplants. This is the reason the US must continue to rely on research done in other solanaceous crops only out of necessity. Work cited for Michigan is also in its nascent stages, and must be repeated at commercial scales to be relied upon. Furthermore, USG believes that the work by Locascio et al. (1997) is relevant for 1,3 D + Pic as that was a treatment specifically included in that study. While Metam with Pic was not a treatment involved, USG has been unable to locate a study showing efficacy comparable to MB for metam, even when Pic is added, when the pests of concern are yellow and purple nutsedges. If MBTOC is aware of such studies, USG would appreciate receiving a copy.

MBTOC QUESTION

7. The sections on yield in Florida and Georgia in the current CUN still rely strongly on other crops. Please provide more information about yield (preferably copies of studies or research reports) of MB alternatives in eggplant in Florida and Georgia, particularly focussing on the following: combinations of fumigants + weed control, using improved application methods which became available in recent years.

US RESPONSE

As was pointed out in the US response to an earlier question, eggplant acreage in the US is considerably smaller than that of peppers or tomatoes, and tomatoes, in particular, dwarf these other vegetable crops in terms of acreage and thus research priority. USG was unable to locate studies of the sort described in this MBTOC question, done specifically on eggplants. This is the reason the US must continue to rely on research done in other solanaceous crops only out of necessity. Thus, USG cannot as yet provide eggplant yield information of the sort requested by MBTOC in this question.

MBTOC QUESTION

8. The table of yield loss analysis for Michigan (Table C.1, page 36) appears to be based entirely on Hausbeck and Cortwright [sic] (2003), a study which is not in the citations list. Table C.1 (on page 36) does not appear to take account of a more recent study by Cortright and Hausbeck (2004), which indicates that 1,3-D + pic provided a higher yield of eggplant than MB (Table 16.2 on page 37). Table C.1 also suggests that the range of yield loss from use of 1,3-D + pic was as high as 95% (page 36). However, experience in use of 1,3-D + pic, in commercial practice and in trials, does not support this degree of loss when appropriate application methods are used, and nutsedge weeds are not key target pests. Please clarify? (The key target pests in Michigan are listed as Phytophthora capsici and Verticillium spp. only (page 31))

US RESPONSE

The Hausbeck and Cortright study has been erroneously stated in different ways in the text, for which USG apologizes. The correct citation is “Hausbeck and Cortright (2004)”. The

citation details for this study are correctly stated in the nomination, except that the order of the authors' names is incorrect. USG submits that yield loss can range as high as 95 % even with the use of 1,3 D + Pic, when *Phytophthora* (the key Michigan pest) pressure is high. In any case, USG tried to use the best case scenario of yield loss in its calculations (i.e., the "best estimate of yield loss" in Table C.1), and NOT the highest possible yield loss, which is 6%.

MBTOC QUESTION

9. (The key target pests in Michigan are listed as *Phytophthora capsici* and *Verticillium* spp. only (page 31)).

US RESPONSE

That is correct. In Michigan, the key target pests are *Phytophthora capsici* and *Verticillium* spp. Florida and Georgia face other/additional pest pressures

Progress in registrations

MBTOC QUESTION

9. What progress has been made in registering products for eggplant: (a) iodomethane, (b) herbicides for nutsedge, (c) furfural, (d) others?

US RESPONSE

Halosulfuron is currently registered for control of nutsedge in fruiting vegetable crops, including eggplant. However, the U.S. label only permits application of halosulfuron between the rows of direct-seeded and transplanted crops. Due to concerns for phytotoxicity, halosulfuron should not come into contact with the eggplant itself. Due to concerns for levels of halosulfuron in the soil post-application, the U.S. label requires specific time intervals before planting successive crops. These time intervals are as long as 36 months after application.

While registration requests are pending for iodomethane and furfural, the registrants for those products are not currently supporting registration of these products on eggplant. The proposed Uses for Outdoor Use of Furfural:

1. Pre- and Post-plant applications to plant propagation beds for ornamentals.
2. Residential and commercial turf, golf courses, sod farms, sports fields, and similar areas.

Copies of studies

MBTOC QUESTION

10. Please provide a copy of the following studies:
(a) Study by Culpepper and Langston performed in 2004 in Georgia (CUN pages 19 and 30). There is no citation for this study in the list of citations in the CUN (section 26).
(b) Study by Culpepper (2004) cited on page 29. There is no citation for this study in the list of citations in the CUN (section 26).

(c) Study by Hausbeck and Cortwright (2003) cited in Table C.1, which forms the justification for the yield loss data summary. There is no citation for this study in the list of CUN citations in the CUN (section 26).
(d) Study by Cortright [or Cortrright] and Hausbeck (2004, Evaluation of fumigants for managing Phytophthora crown and fruit rot of solanaceous and cucurbit crops) which is summarised on page 37. Since this appears to be an unpublished study, it would be useful for MBTOC to see the technical details.

US RESPONSE

(a) and (b) -- Culpeper (2004) and Culpepper and Langston (2004) are unpublished studies or surveys at the moment (as far as USG is aware). The details of these citations are as follows:

Culpepper, A.S. 2004. Infestation of nutsedge species in Georgia vegetable crops during 2003. Unpublished survey from the University of Georgia, Tifton, GA. Submitted with the Georgia eggplant CUE (# 04-0050).

Culpepper, A.S., and D.B. Langston. 2004. Fumigant/herbicide combinations. Unpublished manuscript from the University of Georgia, Tifton, GA. Submitted with the Georgia eggplant CUE (# 04-0050).

Re: (c) and (d): As was stated in an earlier US response, Cortright and Hausbeck and Hausbeck and Cortright, are both incorrectly stated references to the same study. The correct citation is Hausbeck and Cortright (2004). In other words, There should be no reference to "Hausbeck and Cortright (2003) OR Cortright and Hausbeck (2004). The citation details are correctly described in the CUN citations list, except that the order of the authors is reversed.

Area affected by moderate to severe nutsedge pressure

MBTOC QUESTION

11. Please provide survey evidence, or similar supporting evidence, on the prevalence of moderate to high nutsedge pressure in eggplant production regions (or eggplant CUN areas) in Florida, by county.

US RESPONSE

The U.S. has sent separately a presentation on nutsedge biology in response to a question in the strawberry section. The presentation is by Webster, Theodore M. 2005. Should I stay or should I grow? The nutsedge dilemma in polyethylene mulch systems. USDA-ARS, Tifton, GA. A presentation to the Southern Weed Science Society in Charlotte, NC January 26, 2005.

The US does not have new information on extent of pest pressure and is unable to develop this information. In order to design and develop an accurate survey an extensive knowledge base would have to be developed on the growers, geography, state and county borders in relation to farms, and biology of all the target pests. There are the additional issues concerning pest identification and verification because when conducting a survey of growers

the nomenclature of pests, and common names can vary across the country. To determine the pests present in a site (e.g. Phytophthora citricola, P. cactorum, Belonolaimus longicaudatus or Meloidogyne spp.) field sampling would be required with numerous samples per field and extensive laboratory analysis. After a survey instrument is developed funding would need to found to administer, collect, calculate and summarize the information. In addition to the time and money needed to develop a survey instrument the U.S. must fulfill additional requirements for surveys. The entire process to develop and implement a survey is very time and resource intensive. The U.S. requests that MBTOC describe how other countries have provided this information on a county basis to see if there are other ways in which to provide the information.

MBTOC QUESTION

12. The section on Georgia says the area affected by moderate to high nutsedge pressure is considered to be approximately 58% and cites Culpepper (2004) (page 29). MBTOC has requested a copy of this study in the question above. If Culpepper (2004) does not provide data or survey results, or similar supporting evidence, to substantiate the estimated CUN areas subject to moderate to severe nutsedge pressure in Georgia, then please provide additional data.

US RESPONSE

Culpepper (2004) does have some information on nutsedge occurrance (see US response to question 10 above for citation details). The information from Culpepper (2004) was submitted to MBTOC last year. Please inform the U.S. if the is no longer available to MBTOC members.

Telone label relating to Karst geology or topography

MBTOC QUESTION

13. In March 2004 DAS sent the following information to MBTOC (Executive Summary of Key Issues Pertinent to Use of Telone Products as Alternatives to Methyl Bromide in the US, DAS, March 2004.)

- *"A 'karst geology' statement appears on all Telone labels. This statement is intended to restrict the use of Telone products in areas where applications or seepage from applications may infiltrate groundwater.*
- *Use of Telone C-35 (and all other Telone products) is permitted in areas where there is an impeding layer (such as a spodic or argillic layer) that supports seepage irrigation and prevents ground water infiltration. Refer to label wording.*
- *The term 'karst geology' does not have a clear definition nor can an area of 'karst geology' be recognized from the growers' perspective or from an enforcement perspective.*
- *Dow AgroSciences (DAS) and the Florida Department of Agriculture and Consumer Services (FL DACS) have agreed to change this confusing wording from 'karst geology' to 'karst topography' which is definable and recognizable from both a growers perspective and enforcement perspective (see Appendix 2).*

"DAS has worked with the Florida Department of Agriculture and Consumer Services (DACS) to clarify this confusion. The proposal is to change the terminology to 'karst topography.' This is a definable term and 'karst topography' can be recognized by such surface features as sink holes or disappearing streams which are characteristic of karst areas. Florida DACS agrees with this refinement and has written a letter to the EPA in support of the proposal to amend and clarify the label in this way. A copy of DACS letter to EPA and the proposed wording for the label amendment are provided…."

That was the status as reported by DAS in March 2004. The Party is requested to clarify if Florida DACS and the EPA have amended the labels for Telone products so that its use is restricted to areas of 'karst topography' as described above.

US RESPONSE

There have been no changes in the Federal label language for 1,3-Dichloropropene (Telone™) regarding the karst geology versus karst topography language. If approved those label changes would have to be evaluated to determine the impact on 1,3-D usage. Further, any changes to the label by Florida DACS would have to be done after the federal changes, since federal authority generally takes precedence over the state's as regards pesticide regulation.

MBTOC QUESTION

14. The table below indicates soils in 7 counties of Florida, based on SSURGO and row cropland use from the Florida Geographic Data Library. Source: ABG. 2002. Analysis of Methyl Bromide Replacement with Telone in Strawberries in California and Florida and Tomatoes in Florida. Report commissioned by DAS. Does the Party agree with the analysis in the table below? If not, please send corrections or alternative data.

US RESPONSE

Dow AgroSciences presented this information to the EPA earlier this year. :Unfortunately, at that time we were not able to discuss certain parameters of the data. For example at what depth does these soils occur, what is the extent of their continuity at these sites, what is the thickness of the soil (e.g. is it adequate to impede 1,3-D movement into groundwater), what is the rating of impermeability, etc. In addition, after receiving clarification on these issues the EPA would need to have further discussions with the state of Florida. The EPA has tentatively scheduled a meeting with Dow AgroSciences to discuss this issue. Until the meeting has taken place the U.S. is unable to characterize these tables.

MBTOC QUESTION

15. What proportion of the eggplant CUN area in (a) Florida and (b) Georgia has an underlying impeding layer (eg. spodic, argillic layers)?

Analysis of Florida soils in 7 counties, based on SSURGO and row cropland use from the Florida Geographic Data Library. ABG, 2002.

	Spodic/Argillic Layer		No Spodic/Argillic Layer		Non-soil Area		Total Acres
County	Acres	% of Total	Acres	% of Total	Acres	% of Total	Acres
Collier	39,748	83.7	7,555	15.9	210	0.4	47,513
Gadsden	41,433	97.3	987	2.3	184	0.4	42,604
Hendry	10,212	75.4	3,320	24.5	3	0.0	13,535
Hillsborough	23,795	83.8	4,361	15.4	228	0.8	28,384
Lee	9,879	90.7	821	7.5	188	1.7	10,888
Manatee	47,159	98.5	553	1.2	145	0.3	47,857
Palmbeach	25,941	77.5	7,357	22.0	172	0.5	33,470
Total	198,167	88.4	24,954	11.1	1,130	0.5	224,251

US RESPONSE

Please see the answer to number 14 above.

Market windows

MBTOC QUESTION

13. The CUN section on Michigan states that fumigation practices must be completed by first week of May to allow growers to "capture the early market (July – September)" (page 32). Does "first week" mean that planting needs to take place during the first week, or during the 2nd week of May? Does the entire period of July-September comprise the "early" market? Please provide price data for eggplant during the weeks of harvest in Michigan. Since market window is a major basis for the eggplant CUN it is not appropriate to use price data for peppers as stated in the CUN (page 45).

US RESPONSE

Eggplant production in Michigan occurs from May through September with planting in the first and second weeks of May (it is possible, in Michigan, to have frost into May). Harvesting eggplant occurs July through September. By the middle to the end of September most of Michigan has experienced a hard frost and there is no more eggplant production. Because the growing season in Michigan cannot be shifted (due to climate), planting a few weeks later in the year shortens the producing season, on average, by the amount of the time shift.

Prices are highest during the early part of the season when fresh, locally grown, produce is novel and relatively scarce. Prices are lower later as the produce becomes more abundant. Price data for Michigan –grown eggplant were not available. The use of Michigan-grown pepper data was to demonstrate the general pattern of the market window effect faced by Michigan farmers.

MBTOC QUESTION

14. Eggplant growth is curtailed at temperatures below 16°C (page 7), and cold temperatures injure this crop. In Michigan the outside temperature is reported to be 12°C on average in May, the month when eggplant is planted (page 32). When using MB at present, what is the date of first harvest, and yield at first harvest, if eggplant is planted in (a) the 1st week of May, (b) the 2nd week of May, and (c) 3rd week of May?

US RESPONSE

USG does not have the information requested for yields at specific weeks. The table on page 32 (Table 11.1) provides typical time of first harvest (July 1).

Clarification of BUNI data

MBTOC QUESTION

15. The BUNI (page 51) lists metham + pic as the marginal strategy used for Florida and Georgia in the yield loss analysis. However, according to the CUN text sections on Florida and Georgia, metham (alone) was used in the analysis (as described above in Q5).

US RESPONSE

While metam alone was the treatment refereed to in the discussion of a pertinent research study (Locascio et al. 1997) in the CUN text, USG assumed that adding Pic to metam would not significantly alter the yields seen. Studies demonstrating the added utility of Pic with metam have showed highly variable results, particularly where nutsedge pressure was high. Thus the marginal strategy used in the BUNI included Pic, but no additional yields could reliably be estimated (over and above that with metam alone).

MBTOC QUESTION

The BUNI mentions frequency of MB treatment as 1/year for Michigan (page 51), however the CUN states "1 time every 2 years" (page 31). Please clarify.

US RESPONSE

As stated in an earlier US response, the CUN text is erroneous – it should state the MB application frequency as 1/year for Michigan, as the BUNI does.

US HAM - DRY CURE PORK PRODUCTS

MBTOC reference: OzL./MBTOC-CUN/USA/MS/lm

MBTOC QUESTION

1. This CUN is for a critical use for 2007, yet historical use data is only submitted for up to 2002. When will recent historical use data be available?

US RESPONSE

This is a use that is surveyed very rarely, if at all, by USDA NASS. More recent data is currently not available. Even for major agricultural crops, data lag about 2 years. More recent historical data will be provided to MBTOC as it becomes available.

MBTOC QUESTION

2. Which information on historical use should MBTOC use? Table 6.1 page 7 indicates very low historical use between 1998 and 2002 of about 803 – 1139 kg, but the BUNI indicates more than 40,000 kg.

US RESPONSE

Table 6.1 on page 7 (below) of the report reflects historical use in one company. It does not include the historical use information from the American Association of Meat Processors. This organization is making the larger request, since it is the larger consortium. The AAMP does not have historical data, nor does USDA NASS, regarding methyl bromide use on processed meats. MBTOC is correct that the information presented in this table was not adequately described in the U.S. nomination and therefore could have been misinterpreted. The USG estimated number (used in the BUNI) is derived from outside sources, primarily estimates from a few fumigant companies that service this sector (which was then removed from the NPMA nomination).

TABLE 6.1: METHYL BROMIDE CONSUMPTION FOR THE PAST 5 YEARS AND THE AMOUNT REQUIRED IN THE YEAR(S) NOMINATED

	Historical Use[1]						**Requested Use**
For each year specify:	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**[2]	**2007**
Amount of MB (kg)	1,139	1,112	803	1,020	899		169,670
Volume Treated 1000 m³	48	46	35	40	35		7,087
Formulation of MB	Information not provided						Information not provided
Dosage Rate (kg/1000 m³)	24	24	23	25	25		42.4
Actual (A) or Estimate (E)	Information not provided						Information not provided

[1] American Association of Meat Processors did not provide historical data.
[2] None of Applicants provided data for 2003.

MBTOC QUESTION

3. Industry sources indicate to MBTOC that historical use of MB for dry cure pork is likely less than 40,000 lbs (not kg). The CUE adopted for this sector at 16 MOP of 67 tonnes for 2005 appears to substantially exceed requirements. What capacity is there for use of stockpiles in place of this particular nomination?

US RESPONSE

The dry cured pork products sector does not have any registered technically or economically feasible alternatives to alleviate pest pressure. Producers do not have any feasible alternatives in the absence of methyl bromide, and the elimination of this product from the market would cause severe economic hardship because contaminated products cannot be sold and are unsatisfactory to consumers. In accordance with Decision IX/6, the United States takes into account stocks of banked and recycled methyl bromide in allocating its critical use methyl bromide for the dry cured pork products sector. Decisions taken by the Parties, in addition to domestic legislation, govern how material is sourced to meet critical use exemption needs, and stockpiles may be used in accordance with those Decisions and legislation to meet the methyl bromide needs of the dry cured pork products sector. The USG would appreciate receiving any information MBTOC has regarding current use as documented references are lacking.

MBTOC QUESTION

4. Table B1 footnote Page 8 indicates that some facilities have low gastightness. This would result in increased methyl bromide use (plus the added pest pressure indicated in the CUN). For an MB use to be considered critical under Decision XI/6, all technically and economically feasible steps should have been taken to minimize the critical use and any associated emissions of MB. MBTOC views gastightness as an important facet of that aspect of assessment. What is the plan to improve gastightness of dry pork processing establishments that use MB and and for reduction of methyl bromide dosage, frequency and quantity for this year of nomination?

US RESPONSE

USG does not have this information at present. It is anticipated that information related to factors affecting the gas tightness (and the feasibility of retrofitting facilities) will be collected as part of the process of the development of a US management plan, which is to be provided to Protocol Parties in 2006.

This is a very complex situation. Many of the firms using methyl bromide in their operations date back over a century. While there have been new facilities built, renovation is much more frequent. The basic methodology for the production of country hams and similar dry cured items has changed little over the decades. It is not feasible to retrofit the existing facilities for gastightness within a short period of time (by 2007).

However, there have been major changes in the production of all products under both USDA and 28 state inspection programs. Since the establishment of the Hazard Analysis Critical Control Point (HACCP) system for federal and state meat and poultry facilities in the mid-1990's, inspection agencies have discontinued the blueprint approval process for plant design, remodeling or renovation. This responsibility has fallen upon the plant operator and/or third party certification groups.

A major factor here is that HACCP can only be implemented successfully in a facility that operates within a sanitary and safe environment. Thus, plants have established a Sanitation Standard Operating Procedure (SSOP) program as a pre-requisite to HACCP systems.

SSOP takes into account controls for general sanitation, employee hygiene, water potability and operation clean-up and maintenance programs. In addition, a strong emphasis under SSOPs lies in mandates to establish controls to deal with pest, vermin, and other invasive parasites. Any failures lead to non-compliance action against the plant and retention or possible destruction of the product lot involved or produced under less-than-adequate conditions. Simply put, plants are required to have an adequate and carried-on program of facility maintenance and improvement that could include such factors as positive air flow from processing operations to areas outside where pathogens could enter. This may mean that when an outside door is opened, contaminated air could not enter and interface with product. This is important in control of listeria and other airborne pathogens.

Thus, total gastightness may be an unattainable objective in light of requirements of inspection to reduce or eliminate any biological, physical or chemical hazard likely to occur to the product. In an alternative plane, plants are unlikely to waste fumigant or leave plant areas unsealed for reasons of economics, SSOP requirements, product quality, and even optimum temperature maintenance. On-going plant controls under SSOP and HACCP programs require a minimum of program reassessment annually, or they must be reevaluated at anytime there is a change in product, processing, equipment, facility change or even key personnel.

MBTOC QUESTION

5. Informal survey data available to MBTOC suggests that current MB usage in this industry does not exceed 10 tonnes annually.

US RESPONSE

USG would appreciate it if MBTOC would share their informal survey data so that it may be assessed by our scientists for future incorporation into our analysis.

However, it is imperative to understand the dynamics of the meat industry, particularly that segment which uses pork in a process that could range from a three-month to a two-year (or longer production cycle) from raw product to finished product. There are cycles in which pork and green ham are very expensive and times when it is plentiful and available at relatively low cost.

This means that many in the industry enter dry country ham production when market factors are optimal for them, or if they believe they have a chance to bring their finished product to the market at a profit. Too strict limits on methyl bromide production and availability could mean that these intermittent markets would be foregone. The consequences to pork producers should the capability to utilize excess capacity when market factors change could be disastrous. A similar situation happened in the late 1990's with a glut of pork. Production of dry cured pork products under a long-term process was a natural way to help alleviate the weakness of this market and is likely to have contributed to the survival of many of the smallest swine producers.

Nursery & Orchard Uses

FRUIT, NUT AND FLOWER NURSERIES

Please respond to these questions for the fruit, nut, and flower nursery production remaining in the nomination after subtractions were made for QPS and growth adjustments. Please answer for each of the 3 categories "Raspberries", "Fruit and Nut Trees", and "Roses".

Certification Questions

MBTOC QUESTION

1. Is 100% of this nomination for certified propagative material?

US RESPONSE

Yes. All the uses in this nomination are for certified propagative material. As the BUNI demonstrates, however, some portion of these commodities qualifies for methyl bromide under a separate exemption. The nominated hectares still must meet certification requirements and therefore require the use of mbr. This CUN includes roses and fruit and nut tree growers in California, and raspberry nursery growers in California and Washington state.

MBTOC QUESTION

2. Is participation in the certification program mandatory or voluntary? Please provide copy of certification requirements

US RESPONSE

The certification requirement is mandatory programs under the law in the state of California. The program is voluntary in Washington state, however all nursery stock that is exported to the European and South American markets are required by law in the importing country to participate in the certification program. In addition no farmers locally will purchase non-certified stock. Thus, while technically voluntary, because the crop has no value if not certified, the program is in effect compulsory. A copy of CA and WA regulations are attached to this response.

MBTOC QUESTION

3. Are the requirements of the certification program specified in local, regional, or national regulations?

US RESPONSE

Yes. These certification programs are state regulatory programs.

MBTOC QUESTION

4. Is the certification required to export the propagative material within regional, State or international countries (Please specify)?

US RESPONSE

Yes. In California, the certification is required to sell the propagative material for farm planting within or outside of the State which by definition includes movement of the commodity across regional, state, or country borders. For growers in Washington State, the countries where nursery stock is shipped to generally require participation in the certification program.

MBTOC QUESTION

5. What are the certification standards? For example, must be free of specific pests or pathogens, must be free of all pests and pathogens, tolerance levels, plant must be of a certain size, etc.

US RESPONSE

CA certification standards require that nursery stock must be "commercially clean" and then lists the approved methods for meeting this standard. The WA certification program specifies tolerances for galling, visible symptoms of virus, and pest infestation and specifies a required treatment for achieving this standard. The WA state tolerances for nematodes, for example is 0.1% incidence and for disease other than Anthracnose is practically free.

MBTOC QUESTION

6. Is the use of methyl bromide mandated for certification? Is a minimum rate of methyl bromide specified?

US RESPONSE

In CA, methyl bromide or Telone II may be used to meet the certification program standards. However, the conditions under which the regulations allow for use of Telone II are very narrow and for the area nominated in this CUN, not practical to meet. The strawberry nurseries may use Telone II treatment in a dual application technique only in sandy soils. Telone II is not an allowable treatment in clay soils and methyl bromide is the only listed treatment in such circumstances. In sandy soils, Telone II may be applied so long as the soil moisture is no more than 12%, which growers in many parts of the state have found almost impossible to obtain. Some of the growers are able to obtain the requisite soil moisture content for the Telone II application and do use this method of disinfestation. This area that uses Telone II has already been excluded from the US nomination. The minimum treatment rate with methyl bromide ranges from 224 kgs/hectare for sandy soils to 448 ks/hectare for clay loam soils.

In WA state, the law specifies a series of conditions that a field or lot must meet in order to qualify for certification. One of these requirements is treatment with methyl bromide or

other equivalent soil treatments approved by the state department of agriculture. At this time, there are no other chemical treatments approved by the WA Department of Agriculture.

MBTOC QUESTION

7. Are there soil disinfestation measures other than MB that are approved for certification either for specific crops/growing conditions or broadly for many crops/growing conditions? Why can't these be used in the circumstances of the nomination?

US RESPONSE

Both WA and CA regulations specify that methyl bromide must be used to meet the certification standard, although there is one limited exception for the use of Telone II in certain specific situations. The nomination excludes areas that can reasonably use Telone II.

MBTOC QUESTION

8. Please provide data demonstrating that MB results in pest/pathogen-free propagative material. Some data are presented in Section 16 for nematodes on roses and trees, but no pest data is presented for raspberries.

US RESPONSE

Raspberry is a comparatively minor use of methyl bromide and as such does not have as much funding for research as do more economically significant crops such as roses. Methyl bromide is widely accepted by U.S. State regulatory authorities as the primary means for chemical disinfestations of soil. The U.S. is not aware of any studies indicating results to the contrary.

MBTOC QUESTION

9. Please provide data showing that MB alternatives either can or cannot meet pathogen/pest-free level required for certification by providing data comparing pest/pathogen populations on propagative materials grown in 1) soil treated with methyl bromide, 2) untreated soil, 3) 1,3-D and chloropicrin alone and in combination, and 4) other relevant alternatives. While plant growth data are useful, they do not substitute for pest/pathogen data if the certification requirement is for pest/pathogen-free propagative material. Some data are presented in Section 16 for nematodes on roses and trees, but no pest data is presented for raspberries.

US RESPONSE

Other methods of chemical disinfestations may be technically feasible for certain circumstances. The U.S. did not nominate those areas where alternatives may be used for a critical use exemption. Telone II is an allowable treatment under CA state law however the circumstances under which it may be used are limited by soil type and soil condition (temperature, moisture). In addition, in order to be effective, Telone II treatments must be applied twice whereas methyl bromide need only be applied once raising the cost of

treatment and delaying planting thus leading to a potential economic infeasibility for use of this treatment.

MBTOC QUESTION

10. What are the consequences of not meeting the pest/pathogen-free standards? For example, propagative material cannot be sold, material can be sold as lower quality/lower price, propagative materials must be treated before selling to kill pest/pathogen (e.g. hot water dips, etc.), etc.

US RESPONSE

The consequences for not meeting the pest/pathogen free standard are severe. In CA, the crop is prohibited by law from being sold for commercial plantings with one exception. Section 3060.4 (1) (D) of the California Code of Regulations (CCR) administered by CDFA provides that nursery stock which does not meet the standards of pest cleanliness prescribed in Section 3060.2 shall not be sold except by a written agreement between the buyer and the seller which discloses the following: 1) failure to comply with the standards of cleanliness, 2) affirmation of the buyer's agreement to purchase the stock on an "as is" basis, and 3) written agreement by the destination county Agricultural Commissioner that the stock is for planting by the buyer or for resale at retail for non-farm use in the destination county or state. In other words, the buyer can not purchase the stock and then sell it for commercial farm plantings. This exception is difficult and unlikely to be used, therefore loss of certification is tantamount to loss of the entire crop.

In WA, there is no legal restriction preventing the crop from being sold. However farmers will not purchase nursery material from a source that is not certified which effectively prevents sale of the crop. There is no secondary market that will accept non-certified material.

MBTOC QUESTION

11. If certification isn't mandated by law or regulation, is it used as a quality standard demanded or expected in order to market the crop? Why can't MB alternatives be used to meet the quality standard?

US RESPONSE

In CA, certification is required in order to sell the nursery stock, therefore this question isn't applicable. MB alternatives are used where allowable and such areas have been excluded from the area nominated by the Party. In WA, the program is administered by the state government but is voluntary. However no farms will purchase planting stock from a grower who is not certified for fear of soil contamination and the state of Washington has not approved any other treatment for the purposes of certification.

MBTOC QUESTION

12. What are the consequences of not meeting the quality standard? For example, inability to sell crop, lower price for crop, etc.

US RESPONSE

In both the CA mandatory program and the WA voluntary program the consequence of not meeting the quality standard is total loss of the crop grown on that site. The use of methyl bromide is therefore necessary for the economic feasibility of producing a nursery crop.

General Questions

MBTOC QUESTION

13. 90% of raspberry, 99% of rose, and 100% of Fruit & Nut tree's original requests were removed from the nomination as meeting the criteria of QPS. What is the difference between QPS and non-QPS raspberry, fruit and nut tree, and rose nursery production?

US RESPONSE

Please note the forthcoming letter to the Secretariat that corrects the error made in the fruit and nut tree submission. This use is in fact 92% QPS, not 100% QPS. We apologize for the error. The portion of the use that meets the criteria of the QPS exemption have been removed by the Party. Only the portion that does not meet the requirements of the QPS exemption, and that does qualify for a CUE, have been nominated.

Propagative materials that are grown in states with strict certification regulations, such as California, may qualify for the QPS exemption if the commodity crosses a jurisdictional boundary. For example, strawberry runners in CA that are shipped to another county, state, or country qualify for methyl bromide under the QPS exemption. These runners that are not moved across definable geographic boundaries do not qualify under QPS and therefore have been nominated for a CUE. Runners that stay within the county in which they are grown and runners that leave the county all must comply with mandatory pest/pathogen free government imposed requirements.

General Questions

MBTOC QUESTION

14. Party states the proportion of the crop grown with MB is not available. However this information is very important. Can the Party make an "educated guess" at the crop proportion grown with (or without) methyl bromide?

US RESPONSE

The U.S. does not have this information and is unable to develop this information. The U.S. has spent a great deal of time developing a robust, supportable nomination where information is externally verified whenever possible. When we are unable to verify information we have attempted to make this clear to MBTOC. The U.S. hopes that MBTOC appreciates that we are not comfortable with making an 'educated guess' of this information.

MBTOC QUESTION

15. Iodomethane might be registered soon by the EPA. Party is requested to provide information on the possibility of reducing methyl bromide use in 2007 if iodomethane is registered.

US RESPONSE

While an application for registration of iodomethane is pending with EPA, the pending registration request does not seek registration of iodomethane on these crops. Furthermore, it would be premature to characterize the registration as imminent. Under the Pesticide Registration Improvement Act, the Agency must make a determination on the registration eligibility of iodomethane by early 2007. The Agency is not in a position to provide an earlier anticipated registration decision for iodomethane. In addition, once EPA issues a registration at a Federal level, individual states must make decisions on the eligibility of the product for registration in each state. The timing of those decisions is not in the control of the Federal government. Given these circumstances, the U.S. is not able to provide the requested information.

The U.S. determines adoption of alternatives based on the following critical information: has the crop or sector received a registration, the price of the pesticide and its application, the registered use rates, the availability, and large scale efficacy at the registered use rate. Unfortunately, in the case of these crops none of these questions can be answered. The U.S. would be interested in better understanding the methodology MBTOC uses to determine transition to alternatives.

Raspberry Questions

MBTOC QUESTION

16. In section 11ii, Party states "Soil moisture is an important determinant of capacity of 1,3-D efficacy (5)." (5) appears to be a reference for this statement, but no corresponding list of numbered references is provided. Please provide this reference.

US RESPONSE

The U.S. is sorry for this mistake. This was a typographical error that occurred when the reference citations were changed from numbers to citations by name. The correct reference is McKenry, 2001, (McKenry, M. V. 2001. Evaluation of alternatives to methyl bromide for soil fumigation at commercial fruit and nut tree nurseries. Contractor for California Association of Nurseryman. Prepared for California Department of Pesticide Regulation). The year of publication is in question because the website publication lists this as "2001" but the application package lists this as a 2000 document. Available online at: http://www.cdpr.ca.gov/docs/empm/grants/99-00/finlrpts/99-0218.pdf

MBTOC QUESTION

17. Section 13 states that 1,3-D could possibly be considered a cost effective alternative where soil conditions and township caps allow. BUNI does not indicate any adjustments for Regulatory Issues or Soil conditions (unsuitable terrain?) for raspberries. Does this mean that there are no regulatory or soil conditions restricting use of 1,3-D for the raspberry production areas in this CUN? If there are no restrictions on 1,3-D and it is effective, why is methyl bromide needed? If there are regulatory or soil conditions restricting use of 1,3-D, please state % of nomination impacted by these restrictions.

US RESPONSE

The fumigation of raspberry nurseries is very unusual because of the deep rooted nature of these plants (1 to 1.5 meters). The U.S. has had numerous discussions with this applicant to understand the unique nature of the crop. The U.S. request for raspberry nurseries states that 1,3-D could possibly be considered a cost effective alternative but it also discusses the need to control pests 1 to 1.5 meters deep to protect the raspberry roots. The U.S. has not been able to locate sufficient, credible, multiple year studies that indicate that 1,3-D is both technically and economically feasible for control of pests to this depth. If MBTOC is aware of such information the U.S. would greatly appreciate receiving the references so that it may be evaluated. Since this seemed to be more of a depth of control issue more than a soil type issue we did not make any adjustment for unsuitable terrain.

MBTOC QUESTION

18. Party states "container-grown plants produce shorter or curved roots. . . .any reduction in surface area would reduce the number and/or quality of new canes." Please supply a reference for this information.

US RESPONSE

This information was provided by the applicant and described in their consortia request. Because of the deep rooted nature of raspberries (1 to 1.5 meters) previous attempts at container production have not been successful. These early attempts were performed by growers and were not successful so there are not published references.

Fruit and Nut Tree Questions

MBTOC QUESTION

19. Is "incompatible soil moisture" included in the "Unsuitable Soil Terrain" column of the BUNI?

US RESPONSE

Yes, the "Unsuitable Soil Terrain" column factors in "incompatible soil moisture" information when the U.S. calculates the nominated amount.

MBTOC QUESTION

20. Text states that 65% of the area cannot be treated with 1,3-D because of incompatible soil moisture or soil type, or township caps, but BUNI does not show any adjustments for Regulatory

Issues or Unsuitable Terrain. Please provide information on the % of the nomination for Trees that is impacted by township caps and soil moisture/soil type restrictions.

US RESPONSE

The U.S. assumes this question is in reference to the California Deciduous Fruit & Nut Tree Growers request. The applicants requested 134 ha as critical in 2007; in 2003, 623 ha had methyl bromide treatments. Request constitutes 21% of historical (pre CUE) use that is considered critical because of no alternatives. Their request was only for those areas where unsuitable terrain or township caps restricted their use of alternatives. In addition, that use was considered to meet the requirements for Quarantine and PreShipment uses so no methyl bromide was nominated by the U.S. for that group.

MBTOC QUESTION

21. Could a 67:33 formulation of methyl bromide:chloropicrin be used to reduce the amount of methyl bromide use in fruit and nut tree nursery production? If not, why?

US RESPONSE

The U.S. has not been able to locate sufficient, credible, multiple year studies that indicate that a 67:33 mixture is both technically and economically feasible in the circumstances of the U.S. nomination. If MBTOC is aware of such information the U.S. would greatly appreciate receiving the references so that it may be evaluated.

Rose questions

MBTOC QUESTION

22. Table 13 indicates that 1,3-D could be an alternative if no restrictions apply. It further states that "US nomination is for areas where 1,3-D is not effective". Does the Party mean "not available"? If 1,3-D is considered not effective, state the conditions under which it is not effective and the % of the nomination impacted by these conditions. No adjustments for Unsuitable Soils is given in BUNI. If soil moisture or soil type is restricting uptake of alternatives, please state the percentage of the nomination impacted by these restrictions.

US RESPONSE

The U.S. nomination is attempting to describe a situation where 1,3-D is restricted due to limitations such as soil, soil moisture, pest spectrum, or township caps. The nomination estimated that 31 to 44 percent of the rose nursery use of over 600 hectares was impacted due to regulatory issues. The U.S. did not additionally list unsuitable terrain issues because the nomination was for only 1 hectare. Frequently soil moisture is a problem and therefore 1,3-D would be ineffective. .

MBTOC QUESTION

23. Could a 67:33 formulation of methyl bromide: chloropicrin be used to reduce the amount of methyl bromide use in rose nursery production? If not, why?

US RESPONSE

The U.S. has not been able to locate sufficient, credible, multiple year studies that indicate that a 67:33 mixture is both technically and economically feasible in the circumstances of the U.S. nomination. If MBTOC is aware of such information the U.S. would greatly appreciate receiving the references so that it may be evaluated.

MBTOC QUESTION

24. Although Party states that 1,3-D is a technically feasible alternative wherever restrictions do not limit its use, no economic analysis is included with the nomination. Such an analysis is essential for MBTOC to carry out an economic feasibility analysis. Is it the position of the Party, that if 1,3-D is technically feasible for this CUN, it is also economically feasible?

US RESPONSE

Although 1,3-D is a technically feasible alternative, the certification restriction limiting its use precludes it from being used as an alternative. Therefore no economic analysis was included because the growers must meet certification standards and there are no viable alternatives.

"California regulations state that nursery stock must be commercially clean with respect to established pests of general distribution. County agricultural officials may certify a crop based on the completion of a prescribed fumigation regime, such as the use of MB (CDFA, 1996)." (CUN 2005 Nursery Fruit Nut Flower USA, p.30)

MBTOC QUESTION

25. Party is requested to clarify what measures will be taken to reduce and phase-out MB use in the coming years.

US RESPONSE

USG does not have this information at present. This information is required as part of the management plan in 2006 and will be reported to MBTOC as part of the next CUE request cycle.

US FOREST SEEDLINGS

Please respond to these questions for the forest seedling production remaining in the nomination after subtractions were made for QPS, double-counting, growth, and rate adjustments.

Certification Questions

Please respond to these questions for the forest seedling production remaining in the nomination after subtractions were made for QPS, double-counting, growth, and rate adjustments.

Certification Questions

MBTOC QUESTION

1. What % of this nomination is for certified forest seedlings? If 0%, please go to question #13 below.

US RESPONSE

Laws in States across the US vary somewhat but all in the nominated area require forest seedlings to be certified.

MBTOC QUESTION

2. Is participation in the certification program mandatory or voluntary?

US RESPONSE

This certification is required by state law.

MBTOC QUESTION

3. Are the requirements of the certification program specified in local, regional, or national regulations?

US RESPONSE

In state level regulations.

MBTOC QUESTION

4. Is the certification required to export the forest seedlings?

US RESPONSE

If there is a quarantine pest, then it in some cases an importing country may require treatment with methyl bromide. Under such circumstances, the use of methyl bromide would be a QPS use, not a critical use, and therefore outside the scope of consideration for the CUN process.

MBTOC QUESTION

5. What are the certification standards? For example, must be free of specific pests or pathogens, must be free of all pests and pathogens, plant must be of a certain size, etc.

US RESPONSE

The certification requirements state that the seedling must be pest/pathogen free.

MBTOC QUESTION

6. Is the use of methyl bromide or other alternatives mandated for certification? Is a minimum rate of methyl bromide or other alternatives specified?

US RESPONSE

No, with the exception of California and Washington, state regulations generally do not mandate the use of a particular chemical or production practice to meet the performance standard of "pest free" and therefore do not specify minimum dosage rates for the

chemical treatment. However, it is generally recognized that methyl bromide is the only fumigant that can reliably provide such high levels of control under most soil conditions. The U.S. understands that the MBTOC would like to see future research into whether or not methyl bromide actually provides 100% pest control and if other fumigants could provide equivalent or superior performance in a nursery setting. However, at the present time, this research has not been conducted by any Party to the best of our knowledge and represents an area for future exploration.

MBTOC QUESTION

7. Are there soil disinfestation measures other than MB that are approved for certification either for specific crops/growing conditions or broadly for many crops/growing conditions? Why can't these be used in the circumstances of the nomination?

US RESPONSE

Please see response to question 6.

MBTOC QUESTION

8. Please provide data demonstrating that MB results in pest/pathogen-free propagative material.

US RESPONSE

Please see response to question 6

MBTOC QUESTION

9. Please provide data showing that MB alternatives either can or cannot meet pathogen/pest-free level required for certification.

US RESPONSE

Please see response to question 6

MBTOC QUESTION

10. What are the consequences of not meeting the pest/pathogen-free standards? For example, propagative material cannot be sold, material can be sold as lower quality/lower price, propagative materials must be treated before selling to kill pest/pathogen (e.g. hot water dips, etc.), etc.

US RESPONSE

If the crop does not meet the standards, the crop can not be sold.

MBTOC QUESTION

11. If certification isn't mandated by law or regulation, is it used as a quality standard demanded or expected in order to market the crop? Why can't MB alternatives be used to meet the quality standard?

US RESPONSE

The certification is generally mandated by law.

MBTOC QUESTION

12. What are the consequences of not meeting the quality standard? For example, inability to sell crop, lower price for crop, etc.

US RESPONSE

See answer to question 10.

General Questions

MBTOC QUESTION

13. Table 16 reports data for numerous weed control trials. Only 2 trials report data on disease control, both of which show alternatives providing good control. Are there other data that show less disease control with alternatives, or is the basis for this CUN primarily the need for weed control?

US RESPONSE

Discussions with applicants from this sector indicate that weed control is currently the main issue for critical use of methyl bromide. However, diseases are also managed as a result, but other products could potentially be used if disease were the only pest. However, the industry has consistently stated that nutsedge is the greatest problem to production and hence, the critical need for methyl bromide. In addition, the industry is worried that without methyl bromide, diseases could develop into significant management problems that are currently taken care of as a "side effect" of weed control.

MBTOC QUESTION

14. Are there published references to the data reported in Table 16?

US RESPONSE

Reference citations were listed in the Table 16, some are peer reviewed & published, some are in-house publications from Weyerhauser,-Southern and Pacific NorthWest nurseries.

MBTOC QUESTION

15 . Does Table 16 report results across all regions in the CUN? If not, what regions are the data from?

US RESPONSE

Data are primarily from the main forest producing regions of the U.S., i.e., Southern U.S. and Pacific NorthWest nurseries—see reference citations in Table 16.

MBTOC QUESTION

16. Methyl bromide use rates reported in Section 9 of the CUN vary from 21.0 to 39.7 g/m^2. The lower rates are being used by regions who are using a higher % of chloropicrin in the formulation. Why can't the higher chloropicrin % and lower methyl bromide rates be used in all regions?

US RESPONSE

Higher rates are typically used where nutsedge has infested beds extensively. Generally, nutsedge is the key pest in the eastern and southeastern portion of the U.S. and, therefore, typically higher methyl bromide rates are used. However, International Paper manages nurseries in the southern U.S. and appears to have requested a reduced rate for critical use of MB for 2007, to 21.4 g formulation/m^2, from historical uses in 1998-2003 (34.5-39.8 g formulation/m^2). As discussed in the CUN, research is ongoing to determine if chloropicrin with metam-sodium, 1,3-D, and/or herbicides can provide acceptable control of nutsedge even with high pest pressure. The forest nursery industry will soon describe a transition plan to increasingly use alternatives to methyl bromide, but production goals and seedling quality must be maintained. In addition, the U.S. has only nominated methyl bromide rates of 350 kg active ingredient/ha or less unless the applicant can describe why these rates are not effective for their pest spectrum.

MBTOC QUESTION

17. 0-50% of each applicant's original request was removed from the nomination as meeting the criteria of QPS. What is the difference between QPS and non-QPS forest seedling production?

US RESPONSE

QPS forest seedlings meet the requirements specified under the federal QPS program. Typically, these requirements include the following elements: nursery products are grown in states with regulatory certification requirements and the products move across a jurisdictional boundary. The portion of the forest seedling crop that was nominated for a CUN did not meet all of the requirements under the QPS program even though they must meet state regulatory certification requirements.

MBTOC QUESTION

18. Is halosulfuron or trifloxysulfuron registered for weed control in forest seedling production? If not, is future registration planned? If not, why?

US RESPONSE

Neither halosufluron nor trifloxysulfuron are registered for weed control in forest seeding production. Applications are not pending with EPA to register either of these chemicals for this use. USG is not in a position to speculate as to why the registrants are not pursuing registration for this use. Decisions to pursue registration are made by the registrants, not by USG however, a brief search of the internet showed that phytotoxicity ratings in peaches and citrus was over 30% on a 0 to 100 scale (where 100 is complete death of the plant).

MBTOC QUESTION

19. Several regions fumigate only once every 2, 3, or 4 years, rather than annually and point out that use of an alternative might require annual fumigation which could impact cost and increase the amount of pesticides in the environment. Please present economic data showing the projected impact of more frequent fumigations with alternatives. Besides economic and environmental burdens, are there any other reasons that annual fumigation with a methyl bromide alternative would not be feasible?

US RESPONSE

Although MBTOC is perceptive in questioning the impact of more frequent fumigations with the alternatives, the economic analysis in the US Nomination package already reflects a more frequent fumigation practice with alternatives than the methyl bromide fumigation practice of fumigating once every 2, 3, or 4 years. The assumption appears in the increased operating costs per hectare when compared to the operating costs of methyl bromide. The operating costs of the alternatives are based on the assumption that within a two-year cycle, methyl bromide fumigation is calculated to occur once per cycle, while the alternative fumigation is calculated as twice per cycle (once per year) with a yield of one crop. Assumed for every 3 years: 2 harvests for both conifers & deciduous seedlings, 1 harvest for transplants; 2 fumigations for deciduous and 1,3 D + pic on conifers; 1 fumigation for MB and other alternatives on conifers. Assumptions for 4 year cycle: Fumigation occurs once for methyl bromide (1 out of the 4 years) fumigation occurs twice for alternatives (therefore 2 out of the 4 years).

The increase in the operating costs for alternatives include increases in fumigation costs (due to increased frequency or price of alternative), increases in hand weeding costs, additional expenses such as supplemental irrigation and decreases in harvesting costs due to lower yields. The increase in operating costs ranges from $151 ~ $21,103. Increased operating costs are calculated by subtracting the methyl bromide operating costs from the alternatives operating costs from Tables E1~8 of the US Nomination Package. Increased operating costs are highlighted in Table 1 below:

Table1: Changes in Operating Costs

Changes in Operating Costs					
	Methyl Bromide	**Dazomet**	**1,3-D + Chloropicrin**	**Metam Sodium + Chloropicrin**	**Other Alternative**
REGION A	$ -	$ 2,930.00	$ 2,045.00	$ 2,438.00	
REGION B	$ -	$ 2,544.00	$ 2,603.00	$ 2,881.00	
REGION C	$ -	$ 2,411.00	$ 2,411.00	$ 2,411.00	
REGION D	$ -	$ 798.00	$ 776.00	$ 696.00	
REGION E	$ -	$ 1,561.00	$ 1,561.00	$ 155.00	
REGION F	$ -	$ 6,029.00	$ 5,276.00	$ 5,276.00	
REGION G	$ -	$ 1,278.00	$ 1,486.00	$ 1,051.00	
REGION H	$ -				$ 21,103.00

"Total losses are similar for both 1-3-D + chloropicrin and metam-sodium + chloropicrin. Quantifiable losses originate from yield losses and cost increases. Dazomet has slightly higher yield losses than 1-3-D + chloropicrin, and metam-sodium + chloropicrin, but similar treatment costs. Indirect yield losses occurred due to lengthening of the production cycle, which resulted in less land in production and more in fallow or longer time for seedlings to reach appropriate size. Additional losses may also arise due to a shift from high quality Grade #1 seedlings to lower quality Grade #2, which causes a loss of about 30% of value,

and more seedlings that must be culled. Unfortunately, data were lacking to measure this shift. Thus, total losses are underestimated." (CUN2005 Forest Seedlings USA, p. 63)

The estimates above are calculated based on the minimum increase in production costs which are actually an underestimation of operating costs but they already pose a significant economic loss, rendering the alternatives technically and economically infeasible.

MBTOC QUESTION

20. In section 13, inconsistent results in weed control with dazomet and metham sodium are cited. Is the inconsistent weed control a problem in the 1st, 2nd, 3rd, and/or 4th crop following fumigation?

US RESPONSE

Inconsistency of weed control is observed for all applications from the first through the fourth crop. As the growing seasons proceed, the weed populations not effectively controlled will increase, making crops in beds in subsequent years more susceptible to competition from weeds and making weed management more difficult and costly. The overall efficacy is related to reduction of the overall weed population and reduced reproduction. The forest seedling industry is attempting to offset the inconsistent results observed for the alternatives by improving methods of delivery to increase soil exposure to the fumigant (due to low vapor pressure of products such as metam-sodium).

MBTOC QUESTION

21. The Weyerhauser-West region mentioned control of *Phytophthora ramorum* as one reason methyl bromide is needed. Isn't this pathogen a quarantine pathogen?

US RESPONSE

Yes, *Phytophthora ramorum* is a quarantine pest. *Phytophthora ramorum* or sudden oak death is a quarantine pest and the in 2004 USDA issued an emergency restriction on the movement of certain nursery stock grown in California, Oregon, and Washington. In this circumstance, methyl bromide would be available to some of these growers under the QPS exemption. However, the emergency order will sunset by 2007 and those growers who qualify under QPS today will not, under present regulation, qualify in 2007.

MBTOC QUESTION

22. The amounts of methyl bromide stated in tables 8.2, 8.3, 8.5, 8.6, 8.7 and 8.8 are not consistent with the amounts stated in table A.1. Please clarify the correct amounts.

US RESPONSE

MBTOC is correct there are inconsistencies between Table A1 and several of the other tables. Please consider the BUNI as the most up to date version of the information supplied for the nomination.

CORRECTED TABLE A.1: EXECUTIVE SUMMARY FOR FOREST SEEDLINGS*

	A.	B.	C.	D.	E.	F.	G.	H.
REGION	SOUTHERN FOREST NURSERY MANAGEMENT COOPERATIVE	INTERNATIONAL PAPER	ILLINOIS DEPARTMENT OF NATURAL RESOURCES	WEYERHAEUSER SOUTH	WEYERHAEUSER WEST	NORTHEASTERN FOREST & CONSERVATION NURSERY ASSOC	MICHIGAN SEEDLING ASSOCIATION	MICHIGAN HERBACEOUS PERENNIALS
AMOUNT OF APPLICANT REQUEST								
KILOGRAMS (KG)	246,032	26,380	4,264	17,962	16,935	31,922	6,908	4,763
AMOUNT OF NOMINATION								
KILOGRAMS (KG)	83,143	22,279	1,911	11,226	9,637	13,279	6,908	4,246

CORRECTED TABLE 8.2. REGION B - INTERNATIONAL PAPER: AMOUNT OF METHYL BROMIDE REQUESTED FOR CRITICAL USE

YEAR OF EXEMPTION REQUEST	2007
KILOGRAMS OF MB	26,380
USE: FLAT FUMIGATION OR STRIP/BED TREATMENT	flat fumigation
FORMULATION *(ratio of MB/Pic mixture)* TO BE USED FOR THE CUE	98:2
TOTAL AREA TO BE TREATED WITH THE MB OR MB/PIC FORMULATION *(ha)*	127
APPLICATION RATE* *(kg/ha)* FOR THE **ACTIVE INGREDIENT**	210
DOSAGE RATE* *(g/m^2)* OF **ACTIVE INGREDIENT** USED TO CALCULATE REQUESTED KILOGRAMS OF MB	21

CORRECTED TABLE 8.3. REGION C - ILLINOIS DEPARTMENT OF NATURAL RESOURCES: AMOUNT OF METHYL BROMIDE REQUESTED FOR CRITICAL USE

YEAR OF EXEMPTION REQUEST	2007
KILOGRAMS OF MB	4,264
USE: FLAT FUMIGATION OR STRIP/BED TREATMENT	flat fumigation
FORMULATION *(ratio of MB/Pic mixture)* TO BE USED FOR THE CUE	67:33
TOTAL AREA TO BE TREATED WITH THE MB OR MB/PIC FORMULATION *(ha)*	16
APPLICATION RATE* *(kg/ha)* FOR THE **ACTIVE INGREDIENT**	267
DOSAGE RATE* *(g/m^2)* OF **ACTIVE INGREDIENT** USED TO CALCULATE REQUESTED KILOGRAMS OF MB	26.7

CORRECTED TABLE 8.5. REGION E - WEYERHAEUSER-WEST: AMOUNT OF METHYL BROMIDE REQUESTED FOR CRITICAL USE

YEAR OF EXEMPTION REQUEST	2007
KILOGRAMS OF MB	16,935
USE: FLAT FUMIGATION OR STRIP/BED TREATMENT	flat fumigation
FORMULATION *(ratio of MB/Pic mixture)* TO BE USED FOR THE CUE	67:33
TOTAL AREA TO BE TREATED WITH THE MB OR MB/PIC FORMULATION *(ha)*	76
APPLICATION RATE* *(kg/ha)* FOR THE **ACTIVE INGREDIENT**	226
DOSAGE RATE* *(g/m^2)* OF **ACTIVE INGREDIENT** USED TO CALCULATE REQUESTED KILOGRAMS OF MB	22.6

CORRECTED TABLE 8.6. REGION F - NORTHEASTERN FOREST AND CONSERVATION NURSERY ASSOCIATION: AMOUNT OF METHYL BROMIDE REQUESTED FOR CRITICAL USE

YEAR OF EXEMPTION REQUEST	2007
KILOGRAMS OF MB	31,922
USE: FLAT FUMIGATION OR STRIP/BED TREATMENT	flat fumigation
FORMULATION *(ratio of MB/Pic mixture)* TO BE USED FOR THE CUE	98:2
TOTAL AREA TO BE TREATED WITH THE MB OR MB/PIC FORMULATION *(ha)*	93
APPLICATION RATE* *(kg/ha)* FOR THE **ACTIVE INGREDIENT**	347
DOSAGE RATE* *(g/m^2)* OF **ACTIVE INGREDIENT** USED TO CALCULATE REQUESTED KILOGRAMS OF MB	34.7

CORRECTED TABLE 8.7. REGION G - MICHIGAN SEEDLING ASSOCIATION: AMOUNT OF METHYL BROMIDE REQUESTED FOR CRITICAL USE

YEAR OF EXEMPTION REQUEST	2007
KILOGRAMS OF MB	6,908
USE: FLAT FUMIGATION OR STRIP/BED TREATMENT	flat fumigation
FORMULATION *(ratio of MB/Pic mixture)* TO BE USED FOR THE CUE	67:33
TOTAL AREA TO BE TREATED WITH THE MB OR MB/PIC FORMULATION *(ha)*	26
APPLICATION RATE* *(kg/ha)* FOR THE **ACTIVE INGREDIENT**	266
DOSAGE RATE* *(g/m^2)* OF **ACTIVE INGREDIENT** USED TO CALCULATE REQUESTED KILOGRAMS OF MB	26.6

CORRECTED Table 8.8. Region H - Michigan Herbaceous Perennials: Amount of Methyl Bromide Requested for Critical Use

YEAR OF EXEMPTION REQUEST	2007
KILOGRAMS OF MB	4,763
USE: FLAT FUMIGATION OR STRIP/BED TREATMENT	flat fumigation
FORMULATION *(ratio of MB/Pic mixture)* TO BE USED FOR THE CUE	98:2
TOTAL AREA TO BE TREATED WITH THE MB OR MB/PIC FORMULATION *(ha)*	12
APPLICATION RATE* *(kg/ha)* FOR THE **ACTIVE INGREDIENT**	397
DOSAGE RATE* *(g/m^2)* OF **ACTIVE INGREDIENT** USED TO CALCULATE REQUESTED KILOGRAMS OF MB	39.7

MBTOC QUESTION

23. Actual dose rates of region B (Page 22) and D (Page 27) increased in 2003 compared to 2002. Please explain why the dose rates increased.

US RESPONSE

The USG does not have this information. This information pertains to the years prior to the period during which critical use exemptions are required for methyl bromide consumption. During the time covered by this request the US, like many countries, attained compliance with the Montreal Protocol by setting overall limits on consumption and production, as opposed to monitoring/limiting MB use on a sector by sector basis.

MBTOC QUESTION

24. In region D, a formulation of 90:10 methyl bromide:chloropicrin was used during 2000-2002. Why did use return to the 98:2 formulation in 2003?

US RESPONSE

The USG does not have this information. This information pertains to the years prior to the

period during which critical use exemptions are required for methyl bromide consumption. During the time covered by this request the US, like many countries, attained compliance with the Montreal Protocol by setting overall limits on consumption and production, as opposed to monitoring/limiting MB use on a sector by sector basis.

MBTOC QUESTION

25. Party considers containerized or substrate production too expensive for tree seedlings and includes some economic considerations. However, there is no specific validation of the economics for herbaceous perennials (e.g. Delphinium, Hostas, Phlox) also included in this nomination. These species are different from trees with respect to cropping cycle, use, etc, and are propagated in plug trays or liners with different kinds of substrates in many countries and even in the United States (e.g. see reference below). Please present information on why the containerized or substrate production cannot be used for the specific circumstances of this nomination.

Reference: Styer, R.C. and D.S. Koranski 1997. Plug and Transplant production - a Grower's Guide. Ball Publishing, USA, 373 pp.

US RESPONSE

While in many warm season areas perennial crops can be converted to container production Michigan is a colder region of the U.S. Temperatures typically drop below freezing for several months out of the year and the plant roots would freeze.

US ORCHARD REPLANTS

MBTOC QUESTION

1. Based on the information in the text and in the BUNI, it appears that methyl bromide is nominated for critical use in 3 situations:
   - where the "key pest" is/are the causal agent(s) of Replant Disorder which has an unknown etiology (35-50% of the stone fruit area, 35% of the grape area, 85% of the walnut area, and 35-50% of the almond area);
   - where the primary pests are nematodes and maximum allowed rate of 1,3-D is not effective due to fine-textured soils and/or inability to sufficiently the dry the soil at the deeper depths to the level required for effective use of 1,3-D (35-50% of area for all 4 crops)
   - where primary pests are nematodes and Township caps prevent the use of 1,3-D, which would otherwise be expected to be effective (2-8% of area for all 4 crops)

   Please confirm if this is a correct understanding of the nomination. If it is not correct, please clarify.

US RESPONSE

Yes, that is correct.

MBTOC QUESTION

1. For those areas, where the primary pests are nematodes, but 1,3-D cannot effectively be used (situations #2 and #3 above), please clarify why metham sodium, alone or combined with chloropicrin, is not an effective MB alternative and provide references.

US RESPONSE

Metam-sodium and chloropicrin generally have not been recognized as particularly effective nematicides, especially for orchard replant because of failure to penetrate to 1.5 m. Metam-sodium has the potential to kill remnant root tissue, and thus reduce sites for nematode reproduction, but deep roots are generally not penetrated sufficiently (see McKenry, M. V. 1999. The replant problem and its management. Contractor for California Association of Nurseryman. Prepared for California Department of Pesticide Regulation. Catalina Publishing, Fresno, California, USA.) (See CUE 03-0013, CUE 03-0014 request packages of California Grape and Tree Fruit League, and CUE 03-0029 request of California Walnut Commission.). However, research is ongoing to attempt to improve permeation of metam-sodium (e.g., McKenry, M. 2001. Performance of metam sodium drenched to six different replant sites. Annual International Research Conference on Methyl Bromide Alternatives (2001). http://mbao.org/.) As reported in the CUN, research has indicated that additional strategies such as short-term fallow might have a positive effect on orchard replant (Browne, G., Connell, J., McLaughlin S., Lee, R., Schneider, S., and Trout, T. 2004. Potential of chemical and non-chemical approaches for managing Prunus replant disease. Annual International Research Conference on Methyl Bromide Alternatives (2004). http://mbao.org/), but research must be translated to large-scale field situations. The nominated amount for 2007 is to attain successful replant in the interim, especially considering the large investment and great effect that successful fumigation can have on orchard production over many years [see Trout, T., Klonsky, K., and DeMoura, R. 2004. Economics of methyl bromide alternatives for orchard replant in California. Annual International Research Conference on Methyl Bromide Alternatives (2004) (http://www.mbao.org/2004/Proceedings04/009%20TroutT%20mbp-conf04-peach.pdf).]

MBTOC QUESTION

2. In Table 7.1, Average Total Replant Area in 2001 and 2002 and Proportion of Total Replant Area Treated with Methyl Bromide are given only for almonds and are designated as "Not Available" for stone fruit, grape, and walnut. Has this information become available in the time since the nomination was prepared? If so, please provide this info.

US RESPONSE

The USG does not have this information. This information pertains to the years prior to the period during which critical use exemptions are required for methyl bromide consumption. During the time covered by this request the US, like many countries, attained compliance with the Montreal Protocol by setting overall limits on consumption and production, as opposed to monitoring/limiting MB use on a sector by sector basis..

MBTOC QUESTION

3. In Table 8.1 (and in the BUNI), the footnotes indicate that some of the stone fruit and almond area is strip fumigated. Please clarify if the application rate of active ingredient (336 and 364 kg/ha) in the table is the rate per treated unit of area in the strips or how this value was calculated.

US RESPONSE

The nomination requested amounts are for the rate of methyl bromide active ingredient applied to the treated area.

MBTOC QUESTION

4. What were the primary pests in the trial in table 16.1 Stone fruit – specific nematodes, specific fungi, or the unknown replant disorder causal agent(s)?

US RESPONSE

Replant disease (RD) would be considered the primary 'pest'—however, nematodes have traditionally been considered a major factor in the disease complex. As described in the CUN (see, Browne, G., Trout, T. and Bulluck, R. 2002b. Cultural control and etiology of replant disease of Prunus spp. University of California, Sustainable Agriculture Research and Education Program. http://www.sarep.ucdavis.edu/grants/reports/mebr/browne/browne.html), however, research indicates that "…certain *Fusarium* and *Cylindrocarpon* species can contribute to RD, but continued research on RD etiology is needed and underway. Our Chico and Parlier field trials have demonstrated that RD can occur in the absence of significant soil populations of plant parasitic nematodes. Growers often use plant parasitic nematode counts to indicate risk of replant problems, but the results reported here indicate that the information does not predict risk of the RD component of the problems."

MBTOC QUESTION

5. In table 11.1 Grapes, the soil type is given as "light", but BUNI shows that 35-50% of the grape area is impacted by Unsuitable Soil. Since it is not due to fine-textured soils, is the Unsuitable Soil due to inability to dry down the deeper soil depths? Please clarify.

US RESPONSE

The description provided by this consortium indicated that many vineyard soils are light. In these soils, 1,3-D (with chloropicrin, or metam-sodium) where allowed can be effective in establishing a healthy planting. The BUNI indicates the estimated soils that do not allow use of 1,3-D because of caps or incompatible soil type. In addition, most orchards are replanted to land that previously did not support the same crop. This is to reduce the incidence of crop specific pests (e.g., Browne, G., Connell, J., McLaughlin S., Lee, R., Schneider, S., and Trout, T. 2004. Potential of chemical and non-chemical approaches for managing Prunus replant disease. Annual International Research Conference on Methyl Bromide Alternatives (2004). http://mbao.org/; McKenry, M. V. 1999. The replant problem and its management. Contractor for California Association of Nurseryman. Prepared for California Department of Pesticide Regulation. Catalina Publishing, Fresno, California, USA. (See CUE 03-0013, CUE 03-0014 request packages of California Grape and Tree Fruit League, and CUE 03-0029 request of California Walnut Commission.). Therefore, new grape plantings are likely to be on land previously planted to Prunus, and 35-50% may be on moderate to heavy soils.

MBTOC QUESTION

6. In Table 11.1 Walnut, soil type is given as 40% medium and 30% heavy. BUNI states that 35-50% of the area is impacted by unsuitable soils. Does that mean that some of the area

with medium soil types can use alternatives? Which alternatives have been successfully used?

US RESPONSE

As described in #5 above and in the CUN, in soils that are compatible with 1,3-D use (and where legal restrictions do not apply) alternatives have shown acceptable efficacy. The BUNI indicates those soils that were determined to present problems for use of 1,3-D due to moisture issues or fumigant distribution. Walnut orchards, as with other orchard crops, are preferentially replanted in land previously not planted to walnuts. Unsuitable soils for replant were considered to be 35-50% of the potential replant sites.

MBTOC QUESTION

7. In Section 11ii Walnut, the nomination states that 70% of walnut orchard situations are impacted by soil moisture restrictions and township cap restrictions. BUNI shows 35-50% impacted by Unsuitable Soils and 2-8% impacted by Regulatory Issues. If there was no overlap between the two areas, the maximum in the BUNI for Unsuitable Soil and Regulatory restrictions would be 58%. What alternatives are being used in the remaining 12% of the area? Please clarify.

US RESPONSE

As described in the CUN, orchard replants are only fumigated at the establishment of the orchard. Estimations must be made concerning the land that will be used to establish orchards in requesting MB for future use. Establishing orchards are based on economic and market forces as well as land availability. Unlike commodities where exact areas are known and relatively consistent from year to year, orchard replant sites are estimates as to future plantings and crop types (as described in the CUN almond orchards are likely to increase since the last major plantings 20 years ago due to economic incentives). According to McKenry (McKenry, M. V. 1999. The replant problem and its management. Contractor for California Association of Nurseryman. Prepared for California Department of Pesticide Regulation. Catalina Publishing, Fresno, California, USA. (See CUE 03-0029 request package of California Walnut Commission) 70% of current walnut land is subject to unsuitable conditions for effective use of alternatives. In establishing new orchards, current information suggests that when possible, orchard site selection can reduce pest problems in orchard establishment. The estimated 12% might be accounted for by appropriate selection of new walnut sites that have reduced pest pressure and therefore, less of a critical need for MB. In addition, growers are experimenting with alternatives, especially combination of alternatives to attempt to transition from use of MB. Some growers are also attempting new means of deep injecting metam-sodium and using triclopyr to kill remnant roots. These innovative growers account for some portion of orchard replant. Transition plans for alternatives are being developed for submission to the Parties in 2006.

MBTOC QUESTION

8. Is the soil moisture restriction mentioned in section 11ii-Walnut due to surface soil conditions as stated here, or due to deeper soil moisture conditions as described elsewhere in the CUN, or to some combination of both? Please clarify.

US RESPONSE

Soil moisture issues are primarily of concern where 1,3-D could be an alternative except for reduced efficacy because of deep soil moisture—see *McKenry, M. V. 1999. The replant problem and its management. Contractor for California Association of Nurseryman. Prepared for California Department of Pesticide Regulation. Catalina Publishing, Fresno, California, USA. (See CUE 03-0029 request package of California Walnut Commission).*

MBTOC QUESTION

9. Table 16.1 Walnuts refers the reader to Table 16 for stone fruit, grapes and almonds. Are there no data for Replant Disorder or nematode control available on walnuts? If such data are available, please provide.

US RESPONSE

No studies specific to walnut replant were available; however, pest management issues of other orchard and vineyard crops are relevant to walnut replant as well.

MBTOC QUESTION

10. Table 10.1-Almonds states that 30% of the area is impacted by Township caps and 65% by soil moisture issues. BUNI states that only 2-8% of the requested area is impacted by Township caps and 35-50% impacted by Unsuitable Soil issues. What alternatives are being used on the 22-28% of the area impacted by Township Caps, but not requesting critical use MB and on the 15-30% impacted by soil moisture issues, but not requesting MB? Why can these alternatives not be used on the remaining area?

US RESPONSE

Pest pressure, or lack thereof, is the most likely explanation. Alternatives such as fallow, tolerant rootstock, herbicides combined with metam-sodium, etc. can be relatively effective where pest pressure is considered low. This may be the case on land previously planted to other crops where pathogens are not likely to significantly affect the newly planted almonds. Areas where pest pressure is higher, or land that must be replanted with almonds, are considered to have a critical need for MB and alternatives are likely to provide a less healthy orchard and reduced long-term production.

MBTOC QUESTION

11. In Table 16.1 – Almond, what were the primary pests in the trial – specific nematodes, specific fungi, or the unknown replant disorder causal agent(s)?

US RESPONSE

As described in the CUN (see, Browne, G., Trout, T. and Bulluck, R. 2002b. Cultural control and etiology of replant disease of Prunus spp. University of California, Sustainable Agriculture Research and Education Program. http://www.sarep.ucdavis.edu/grants/reports/mebr/browne/browne.html) research indicates that "…certain *Fusarium* and *Cylindrocarpon* species can contribute to RD, but continued research on RD etiology is needed and underway. Our Chico and Parlier field trials have demonstrated that RD can occur in the absence of significant soil populations of plant parasitic nematodes. Growers often use plant parasitic nematode counts to indicate risk of

replant problems, but the results reported here indicate that the information does not predict risk of the RD component of the problems."

MBTOC QUESTION

12. In Section 23, the nomination states that orchard replant research will require 1658 kg per year of MB for 2005 and 2006. This is the 2007 nomination, and BUNI shows a research amount of 1658 kg, so is it accurate to say that 1658 kg of MB is also needed for research in 2007?

US RESPONSE

Yes, the 2007 nomination should include 1658 kg of methyl bromide for research for a total request of 405,415 kg.

US STRAWBERRY NURSERIES

MBTOC QUESTION

1. What are the constraints to much wider use of VIF, combined with MB and other fumigants as 1,3-D and Pic, where applicable combined with solarization.

US RESPONSE

California restricts use of VIF because of worker exposure risk concerns when the tarp is removed. Other constraints include lack of experience with the material and ongoing development of the material to address users concerns of application difficulties and disposal issues. Florida research—although, in strawberry fields, not nurseries (Noling, J.W., 2004—http://www.mbao.org/2004/Proceedings04/001%20Noling%20paper.pdf), indicated that VIF has the potential to reduce MB rates while retaining efficacy, but application problems and costs were problematic. These issues will be addressed by the industry, and resolved with time and research.

Large scale field trials in the U.S. have not demonstrated a reduction in methyl bromide emissions when using high barrier or VIF films. During bilateral consultations between the US and MBTOC in Prague on this matter, we understood that MBTOC also did not have field trial data on emissions comparing VIF to other types of film. The permeability of films under laboratory conditions has been tested. However, under field conditions emission rates do not appear to be reduced. If MBTOC is aware of such information the U.S. would greatly appreciate receiving the references so that it may be evaluated.

Solarization is difficult in strawberry nursery operations because the strawberry nursery plants are planted in May and June in California and April and May in the Southeast. Under the current production system the solarization would need to be conducted almost a full year in advance to the nursery planting. Assuming there is enough heat for proper solarization to take place the treated area would need to be protected from recontamination for seven to eight months.

Certification:

MBTOC QUESTION

2. Is 100% of this nomination for certified propagative material?

US RESPONSE

Yes. All of the runners nominated are required to meet the CA nursery program requirements.

MBTOC QUESTION

3. Has part of the nomination been exempted under QPS? Specify amount/proportion XXt(eg 80%)?

US RESPONSE

Yes, according to the BUNI, 99% of the requested amount is exempted under QPS. The remaining 1% or 1,375 kgs, does not qualify for the QPS exemption even though it must meet California mandated certification requirements that require fumigation with methyl bromide. Areas that can be reasonably treated with Telone II combinations to meet the certification standard have been excluded from the nomination. We have determined this remaining amount meets the criteria for a critical use exemption and has therefore been nominated for a CUN.

MBTOC QUESTION

4. Is participation in the certification program mandatory or voluntary? Please provide copy of certification requirements

US RESPONSE

Participation is mandatory. The U.S. has attached the CA regulations to this response document.

MBTOC QUESTION

5. Are the requirements of the certification program specified in local, regional, or national regulations?

US RESPONSE

In California state regulations.

MBTOC QUESTION

6. Is the certification required to export the propagative material within regional, State or international countries (Please specify)?

US RESPONSE

Yes. In California, the certification is required to sell the propagative material for farm planting within or outside of the State which by definition includes movement of the commodity across regional, state, or country borders.

MBTOC QUESTION

7. What are the certification standards? For example, must be free of specific pests or pathogens, must be free of all pests and pathogens, tolerance levels, plant must be of a certain size, etc.

US RESPONSE

CA certification standards require that nursery stock must be "commercially clean" and then lists the approved methods for meeting this standard.

MBTOC QUESTION

8. Is the use of methyl bromide mandated for certification? Is a minimum rate of methyl bromide specified?

US RESPONSE

In CA, methyl bromide or Telone II may be used to meet the certification program standards. However, the conditions under which the regulations allow for use of Telone II are very narrow and for the area nominated in this CUN, not practical to meet. The strawberry nurseries may use Telone II treatment in a dual application technique only in sandy soils. Telone II is not an allowable treatment in clay soils and methyl bromide is the only listed treatment in such circumstances. In sandy soils, Telone II may be applied so long as the soil moisture is no more than 12%, which growers in the strawberry production region have found almost impossible to obtain. The minimum rate of methyl bromide specified for the certification program treatment ranges from 224 kgs/hectare for sandy soils to 448 ks/hectare for clay loam soils.

MBTOC QUESTION

9. Are there soil disinfestation measures other than MB that are approved for certificate on either for specific crops/growing conditions or broadly for many crops/growing conditions? Why can't these be used in the circumstances of the nomination?

US RESPONSE

In addition to methyl bromide, Telone II is also approved for use in certain circumstances as described in A8 of this section. The U.S. nomination only includes areas where the use of Telone II is infeasible, such as those set out in answer number 8.

MBTOC QUESTION

10. Please provide data demonstrating that MB results in pest/pathogen-free propagative material.

US RESPONSE

It is generally recognized that methyl bromide is the only fumigant that can reliably provide such high levels of control. The U.S. understands that the MBTOC would like to see future research into whether or not methyl bromide actually provides 100% pest control and if other fumigants could provide equivalent or superior performance in a nursery setting. However, at the present time, this research has not been conducted by any Party to the best of our knowledge and represents an area for future exploration. In

any case, in California, methyl bromide and Telone II meet the certification requirement because it is listed as an approved treatment.

MBTOC QUESTION

11. Please provide data showing that MB alternatives either can or cannot meet pathogen/pest-free level required for certification by providing data comparing pest/pathogen populations on propagative materials grown in 1) soil treated with methyl bromide, 2) untreated soil, 3) 1,3-D and chloropicrin alone and in combination, and 4) other relevant alternatives. While plant growth data are useful, they do not substitute for pest/pathogen data if the certification requirement is for pest/pathogen-free propagative material.

US RESPONSE

Other methods of chemical disinfestations may be technically feasible for certain circumstances. The U.S. did not nominate those areas where alternatives may be used for a critical use exemption.

MBTOC QUESTION

12. What are the consequences of not meeting the pest/pathogen-free standards? For example, propagative material cannot be sold, material can be sold as lower quality/lower price, propagative materials must be treated before selling to kill pest/pathogen (e.g. hot water dips, etc.), etc.

US RESPONSE

The consequences for not meeting the pest/pathogen free standard are severe. In CA, the crop is prohibited by law from being sold for commercial plantings with one exception. Section 3060.4 (1) (D) of the California Code of Regulations (CCR) administered by CDFA provides that nursery stock which does not meet the standards of pest cleanliness prescribed in Section 3060.2 shall not be sold except by a written agreement between the buyer and the seller which discloses the following: 1) failure to comply with the standards of cleanliness, 2) affirmation of the buyer's agreement to purchase the stock on an "as is" basis, and 3) written agreement by the destination county Agricultural Commissioner that the stock is for planting by the buyer or for resale at retail for non-farm use in the destination county or state. In other words, the buyer can not purchase the stock and then sell it for commercial farm plantings. Because of the limited and restrictive nature of this exception, we believe that loss of certification is tantamount to the loss of the entire crop.

MBTOC QUESTION

13. If certification isn't mandated by law or regulation, is it used as a quality standard demanded or expected in order to market the crop? Why can't MB alternatives be used to meet the quality standard?

US RESPONSE

Not applicable

MBTOC reference: OzL./MBTOC-CUN/USA/MS/gao

US ORNAMENTALS

MBTOC QUESTION

1. MBTOC is still not clear as to the proportion of the cropping area that is presently treated. In the BUNI form at the end of the nomination there is a column labeled "regional areas" where 11% is indicated for California and 90% for Florida. Party is asked to clarify if this corresponds to the treated area.

US RESPONSE

The U.S. understands MBTOC's point that the proportion of cropping area treated and the acreage figures (see Question 2) are not clear. However, the acreage figures contained in the *USDA Floriculture and Nursery Crops Situation and Outlook Yearbook, June 2004*, are for floriculture crops in general and includes cut flowers, cut cultivated greens, potted flowering plants, potted foliage plants, bedding and garden plants, and propagatives. The request for methyl bromide is only for cut flowers, cut greens, and bulb crops. Also, the publication mentioned above only includes growers with $100,000 or more in annual floriculture sales. Therefore, the U.S. determined that using acreage information from the 2002 Census of Agriculture would be more accurate. This is also an official publication and is available at the web address http://www.nass.usda.gov/census/ . The U.S. has revised Table 7.1 with the 2002 Census of Agriculture data.

The proportion of total crop area treated with methyl bromide includes historical data from California (2002) and Florida (2003). Since the nominated amount is less than the historically treated areas, the proportion of total crop area treated with methyl bromide in 2007 should be less than indicated in the revised Table 7.1.

TABLE 7.1: PROPORTION OF CROP (CUT FLOWERS, CUT FLORIST GREENS, BULBS, CORMS, RHIZOMES, AND TUBERS) GROWN USING METHYL BROMIDE

REGION WHERE METHYL BROMIDE USE IS REQUESTED	TOTAL CROP AREA (HA)*	PROPORTION OF TOTAL CROP AREA TREATED WITH METHYL BROMIDE (%)**
California	5,795	6%
Florida	5,402	26%
NATIONAL TOTAL:	15,542	11%

* 2002 Census of Agriculture for cut flowers and cut florist greens, and bulbs, corms, rhizomes and tubers – dry

** For proportion of total crop area treated, included historical methyl bromide data from 2002 and 2003. For national total, included data from California and Florida only.

MBTOC QUESTION

*2. Acreages submitted by Party for the American Flower industry do not seem to coincide with those appearing in official publications such as USDA Floriculture and Nursery Crops Situation and Outlook Yearbook/FLO-2004/June 2004, **www.ers.usda.gov***

US RESPONSE

See response to Question 1 and the revised Table 7.1.

MBTOC QUESTION

3. Party states that regulatory constraints such as township caps restrict MB use in California. MBTOC is not clear as to what percentage of the cropping area is affected by this restriction. Party states that "It is expected that about 30% of the 2000 fumigated area could not have used 1,3-D at the current 2x cap which is expected to apply through at least 2004." MBTOC requests Party to confirm that this holds for 2007. The BUNI form states that township caps (regulatory issues) affect between 31 and 44% of area.

US RESPONSE

If 2x township caps are in place in 2007, then 31% of the cut flower, cut foliage, and bulb area will be affected. If 1x township caps are in place, then 44% of the area will be affected. The Party is unable to predict which township caps will be in place in 2007. The California Department of Pesticide Regulation has been contacted for clarification on this matter.

MBTOC QUESTION

4. Party states that buffer zones restrict use of 1,3-D because often flowers are produced on small parcels of land, often near homes. 1,3-D cannot be used in greenhouses. Party is asked to confirm what proportion of the cropping area is affected by this issue. On p. 55 Party states that buffer zones "will reduce cropping area by 10%." The BUNI however allocates a 0 under the buffer zone column for both California and Florida, although it cites karst topography as affecting 40% of area in Florida.

US RESPONSE

Because of the nature of the target pest spectrum, the U.S. considered that metam sodium was the best available alternative. The target pests are listed as soil borne plant pathogens, weeds, and nematodes, including *Fusarium* spp., *Rhizoctonia* spp., *Phytoplithora*, Stromatinia, *Pythium* spp., *Erwinia*, and most soil nematodes i.e. *Meliodogyne* spp., and previous crop propagules. Therefore, while buffers and karst geography will impact the use of 1,3-D, these same factors will not impact the assessment of using metam sodium. In the discussion in the document the U.S. is addressing the potential to transition into 1,3-D which because of the numerous technical difficulties (e.g. control of the previous crop) is not considered technically and economically feasible in the circumstances of the nomination.

MBTOC QUESTION

14. What are the consequences of not meeting the quality standard? For example, inability to sell crop, lower price for crop, etc.

US RESPONSE

See answer to question 12.

MBTOC reference: OzL./MBTOC-CUN/USA/MS/gao

FURTHER QUESTIONS FOR PARTIES SUBMITTING CRITICAL USE NOMINATIONS FOR ORNAMENTALS

MBTOC QUESTION

Ornamental CUN – 2006 (previously unable to assess) and 2007

1. Both the California and Florida sections cite buffer zones restrictions as limitations on the use of metam sodium, but BUNI doesn't reflect any buffer issues. What are the buffers in Florida and California for use of metam sodium?

US RESPONSE

There are no buffer zone restrictions on the labels for metam sodium in California and Florida. BUNI always considers restrictions due to buffer zones but in this case there are none and therefore does not constitute an impact. In this case, combined impacts are already at 100% and are driven by the other factors (key pest distribution, regulatory issues, Karst topography). However, a memo found on the California Department of Pesticide Regulation website states that: "Individual county agricultural commissioners may adjust the buffer zones recommended by DPR for local conditions." It further states that: "County agricultural commissioners may or may not require buffer zones for metam-sodium fumigations." (APPENDICES, Ambient Air Monitoring for Chloropicrin and Breakdown Products of Metam Sodium in Monterey and Santa Cruz Counties-Fall 2001, Planning and Assessment Quality Management Branch, Monitoring and Laboratory Division, Project No. POI-004, December 23, 2003, Web address: http://www.cdpr.ca.gov/docs/empm/pubs/tac/tacpdfs/chlor_metsod04_append.pdf)

MBTOC QUESTION

2. The values in Table 12.1 of the 2006 nomination (submitted in 2004) differ from values for the same information in Tables 12.1 California and 12.1 Florida in the 2007 nomination (submitted in 2005). Are the values in the 2007 nomination the revised, updated values and MBTOC should disregard the values in the 2006 table? For example, the 2006 table shows 529 ha treated with methyl bromide in California in 2002, but the 2007 table shows 364 ha treated in California in 2002. Another example is the amount of methyl bromide used in California in 2002 is given as 17,395 kg in the 2006 nomination, but the value for California methyl bromide use in 2002 is given as 65,079 in the 2007 nomination. Which values are correct?

US RESPONSE

The U.S. strives to provide the most accurate information available. The cut flower, cut foliage and bulb crop industry is diverse, and methyl bromide usage figures are difficult to obtain. The information included in the nomination is the most current information that is accessible at the time of the preparation of the nomination packages for the corresponding year of the nomination package. The data presented in the 2007 nomination is an example of refining the process of the CUN and is accurate for the 2007 nomination package.

IN CALIFORNIA

MBTOC QUESTION

3. Party states that regulatory constraints such as township caps restrict MB use in California. MBTOC is not clear as to what percentage of the cropping area is affected by this restriction. Party states that "It is expected that about 30% of the 2000 fumigated area could not have used 1,3-D at the current 2x cap which is expected to apply through at least 2004". MBTOC requests Party to confirm that this holds for 2007. The BUNI form states that township caps (regulatory issues) affect between 31 and 44% of area. Is this based on the 1X cap or are there regulatory restrictions in addition to the Township Caps or does this reflect increased use of 1,3-D for various crops in the townships that grow cut flowers?

US RESPONSE

If 2x township caps are in place in 2007, then 31% of the cut flower, cut foliage, and bulb area will be affected. If 1x township caps are in place, then 44% of the area will be affected. The Party is unable to predict which township caps will be in place in 2007. The California Department of Pesticide Regulation has been contacted for clarification on this matter.

MBTOC QUESTION

4. Table 11.7 shows 2609 ha for field production and 145 ha for greenhouse production in California. The table legend says this is a partial listing. Table 7.1 shows the Total Crop Area for California of 10,054 ha. This suggests that Table 11.7 only represents about 27% of the crop. Is this correct? What is the other 73% of the crop?

US RESPONSE

Table 7.1 (below) has been revised with U.S. Census of Agriculture data.

With the changes made to Table 7.1, Table 11.7 represents about 58% of crop. The USG does not have additional information on the other portion of the crop. However, it should be noted that this industry grows hundreds of species and it is difficult to develop a complete list of species, especially given the dynamic nature of the industry.

TABLE 7.1: PROPORTION OF CROP (CUT FLOWERS, CUT FLORIST GREENS, BULBS, CORMS, RHIZOMES, AND TUBERS) GROWN USING METHYL BROMIDE

REGION WHERE METHYL BROMIDE USE IS REQUESTED	TOTAL CROP AREA (HA)*	PROPORTION OF TOTAL CROP AREA TREATED WITH METHYL BROMIDE (%)**
California	5,795	6%
Florida	5,402	26%
NATIONAL TOTAL:	15,542	11%

* 2002 Census of Agriculture for cut flowers and cut florist greens, and bulbs, corms, rhizomes and tubers – dry
** For proportion of total crop area treated, included historical methyl bromide data from 2002 and 2003. For national total, included data from California and Florida only.

MBTOC QUESTION

5. Section 16 states that ranunculus exported to several countries need a certificate stating it has been grown in a manner not conducive to certain diseases which generally means fumigation with methyl bromide. Could this particular use be considered as a QPS use of methyl bromide?

US RESPONSE

The US has not made a determination as to the QPS status of this crop. The US will carefully work with the commodity group to review the various regulations and determine if some portion of ranunculus may qualify as QPS for next year's CUN.

IN FLORIDA
MBTOC QUESTION

6. Table 7.1 shows Total Crop Area for Ornamentals – CA, Cut Flower and Foliage – FL, and Caladium – FL, but the BUNI shows only Cut Flower – CA and Cut Flower – FL. Is the caladium portion of the request included in the Cut Flower – FL request?

US RESPONSE

Table 7.1 (see response to question 4) has been revised and includes only one row for California and one row for Florida. Caladiums are included in the Florida portion of the request.

MBTOC QUESTION

7. Table 12.1 for Florida Ornamentals shows that the 2003 use of methyl bromide is 622,328 kg and the request for 2007 is 70,760 kg. MBTOC would like to know what alternatives have made such a significant reduction possible.

US RESPONSE

Florida requested 79,379 kg and the US nominated 70,760 kg of methyl bromide for 2007. The applicant did not specify why the request was for a lower amount than the historical use. This information pertains to the years prior to the period during which critical use exemptions are required for methyl bromide consumption. During the time covered by this request the US was in full compliance with all provisions of the Montreal Protocol.

MBTOC QUESTION

8. The historical application rate used in Florida is high (439 kg/ha). Is there data available to show that lower rates are not effective under the conditions in which the Florida crop is grown?

US RESPONSE

The U.S. has only nominated a use rate of 350 kg ai/ha for ornamentals. The U.S. has nominated the lower use rate until the applicants can demonstrate that this lower use rate is not effective.

MBTOC QUESTION

9. The Florida section of the nomination states that most caladium growers will not use metam sodium because they must meet certification requirements for several domestic and international markets. Could this use be considered as a QPS use?

US RESPONSE

The US has not made a determination as to the QPS status of this crop. The US will carefully work with the commodity group to review the various regulations and determine if some portion of caladium may qualify as QPS for next year's CUN.

MBTOC QUESTION

10. The nomination states that research trials often don't reflect a robust test of alternatives due to the historical use of methyl bromide in the fields where the trials have been conducted. This is a valid concern. Are there any additional research results that have become available since this nomination was originally submitted?

US RESPONSE

The USG is unaware of any such research.

US PEPPERS

MBTOC reference: OzL./MBTOC-CUN/USA/MS/gao

MBTOC QUESTION

1. Please provide official statistics of pepper production in the States of Alabama, Arkansas, Kentucky, Louisiana, South Carolina, Tennessee, and Virginia and MB use in those States.

US RESPONSE

USDA's statistics do not accurately track states that have small areas of production for a given commodity. Since peppers are a relatively small acreage crop nationwide, statistical sampling is used to supplement census surveys, so it is difficult to determine how accurate acreage estimates are for a given state. We have used production and MB use statistics provided by grower groups in specific states, along with historical data on overall national production of peppers, to arrive at the numbers cited in the pepper nomination. Production data for 2002 for all of the states mentioned can be obtained from the Census of Agriculture. The website is that was used is available at: http://www.nass.usda.gov/census/

MBTOC QUESTION

2. Total area to be treated with the MB in Florida (Tables 8.1&12.1) is 8,417 ha, while total area in the State is 7,893 ha (table 7.1). Please explain?

US RESPONSE

It is not clear what MBTOC is referring to in Table 7.1. That table cites 8215 ha (not 7893 ha). Furthermore, this Table shows historical areas on which MB has been used and thus the figure of 8215 ha is the average area treated in 2001 and 2002. Table 12.1 shows (among other things) the acres treated with MB in 2003 for each region, and in Florida that was 8417 ha. Thus the USG used that (most recent) figure to estimate the area for which MB was requested (Table 8.1). Also, please refer to Table A.1 for the area actually nominated for MB use by USG. According to the Census of Agriculture bell pepper alone were grown on 17,028 acres (6896 ha). Therefore, when considering all production of all types of peppers 8215 ha using methyl bromide is a rational estimate.

MBTOC QUESTION

3. Please provide accurate information, on a county basis, about yellow and purple nutsedge high and moderate infestations and its coincidence within pepper crop areas for the Southeast States, Georgia and Florida.

US RESPONSE

The U.S. has sent separately a presentation on nutsedge biology in response to a question in the strawberry section. The presentation is by Webster, Theodore M. 2005. Should I stay or should I grow? The nutsedge dilemma in polyethylene mulch systems. USDA-ARS, Tifton,

GA. A presentation to the Southern Weed Science Society in Charlotte, NC January 26, 2005.

The US does not have new information on extent of pest pressure and is unable to develop this information. In order to design and develop an accurate survey an extensive knowledge base would have to be developed on the growers, geography, state and county borders in relation to farms, and biology of all the target pests. There are the additional issues concerning pest identification and verification because when conducting a survey of growers the nomenclature of pests, and common names can vary across the country. To determine the pests present in a site (e.g. Phytophthora citricola, P. cactorum, Belonolaimus longicaudatus or Meloidogyne spp.) field sampling would be required with numerous samples per field and extensive laboratory analysis. After a survey instrument is developed funding would need to found to administer, collect, calculate and summarize the information. In addition to the time and money needed to develop a survey instrument the U.S. must fulfill additional requirements for surveys. The entire process to develop and implement a survey is very time and resource intensive. The U.S. requests that MBTOC describe how other countries have provided this information on a county basis to see if there are other ways in which to provide the information.

MBTOC QUESTION

4. Please provide accurate information, on a county basis, about occurrence of the karst geology phenomena and its coincidence with pepper crop areas for the States of Georgia and Florida.

US RESPONSE

In most cases the USG was unable to match information on Karst geology with growing areas of specific crops[1]. The best available information was used. Where site-specific information was available, it was used. Where such information was not available, the USG assumed that all crops grown in the state were independently and identically distributed across karst soils. In other words, the USG assumed that the proportion of each crop grown in karst soils was equal to the proportion of that state's agricultural land that comprised karst soils. For Florida, for example, approximately 40% of that State's agricultural land overlays karst topography[2], so 40% of each Florida crop forming part of the US nomination (tomatoes, strawberries, peppers…) is analyzed as if it is grown in an area overlaying karst topography. Although this procedure may be inaccurate with respect to a specific crop, because it accurately captures the overall proportion of agricultural land and thus agricultural crops where certain alternatives to methyl bromide cannot be used, it will give a correct total picture of methyl bromide need.

[1] The exception is Dade County, Florida. By 1,3-D cannot be used in Dade County so that for purposes of the BUNI analysis, all of Dade County is treated as having karst topography.
[2] With the exception of Dade County (as noted above) which is treated as having 100% karst topography.

MBTOC QUESTION

5. California: area treated in 2002 was 121 ha (table 12.1), while MB is requested for 759 ha. Please explain?

US RESPONSE

The area requested by the California pepper applicant was larger than the historic usage in 2002. According to statistics from the California Department of Pesticide Regulation (available at www.cdpr.ca.gov/docs/pur/pur03ep/chrmpt03.pdf), 751 acres (= 300 ha) of 'fruiting peppers' were treated with methyl bromide in 2003. This is an increase over 2002 (when, according to the pepper nomination) 121 ha were treated). The U.S. nominated 80 ha as meeting the criteria of a critical need. It is possible that the applicant included more hectares because two of the counties in California exceeding the township caps in 2004 in which case 1,3-D would not be available for use on peppers.

MBTOC QUESTION

6. For the control of Phytophthora in Michigan, 1,3 D + chloropicrin is a key alternative with efficacy comparable to MB. According to the CUN, the main problem for its adoption is a potential delay in planting as long as 28 days low soil temperatures. Fumigation operations need to be completed by the first week of May to capture an early market window. In Michigan, Soil temperatures in April vary between 10-15 °C. 1,3 D+Pic can be applied when soil temperature is higher than 5°C as it is the case in Michigan in April. Therefore, can we consider soil temperature as a limiting factor for the soil fumigation with 1,3D+Pic?

US RESPONSE

Soil temperatures in Michigan do not consistently climb over 10°C until after mid to late May (Schaetzl and Tomczak, 2001, listed in the citations in the nomination), and thus neither 1,3-D nor metam products can be used effectively for early pepper planting in Michigan. The nomination does mention that temperatures in April are in the 10-15°C range, but this is erroneous. According to temperature data from Michigan State University's agricultural experiment station (available through its website, www.maes.msu.edu), soil temperatures even at a relatively shallow depth (4 inches) range from a minimum of 3.8 °C to 13.8 °C. Even within this range, temperatures fluctuated down to the minimum frequently, and it was not until mid-May (after May 11) that they remained consistently above 10 °C. While these temperatures are above the absolute minimum (4.4 °C) needed to legally apply 1,3 D, the efficacy of this fumigant is lower at low temperatures. The good efficacy seen in the most promising trials was seen at temperatures between 10 – 15 °C. Given these aspects, and the corrected temperature range for April, USG must continue to ask MBTOC to consider soil temperature as a significant limiting factor for fumigation with 1, 3 D+Pic.

MBTOC QUESTION

7. In Michigan, it was stated that the range of yield loss varies between 0% and 6% yield in plots fumigated with 1,3 D+ Pic compared to MB (2003). In a trial undertaken in 2004, yields from pepper plots treated with various alternatives (metham potassium, alone or in combination with chloropicrin, 1,3-D + chloropicrin) are comparable to yields from plots treated with MB +

chloropicrin and yields from control plots. These results indicate a very low pest pressure in all treated and control plots. Therefore, if the experiments have been conducted in plots with a very low pathogens pressure, has the Phytophthora distribution in Michigan been established? If yes, what is the % of the areas with poor, moderate and high pathogen pressure? Same question for the other pests in the US pepper production states.

US RESPONSE

Phytophthora appears to be ubiquitous in vegetable fields in Michigan, as recent studies of water used for irrigation indicate (Gevens and Hausbeck 2003, listed in the citations section of the nomination). While it is possible that the studies described in MBTOC's question involved low pest pressure, USG cannot support or refute this because the study authors do not seem to have quantified pathogen populations. In that study the authors did apply fumigants in June, when soil temperatures are well above those in early spring when these treatments are applied in commercial pepper production. Thus these treatments may have had unusually good suppressive effects on the pest pathogens and thus yield losses seen may be atypical for that reason and not low pathogen pest pressure. USG cited this study as the best case scenario available (for Michigan peppers) at the time the pepper nomination was written. Please see the answer to Question 3 to address the availability of additional pest and pathogen pest pressure survey data.

MBTOC QUESTION

8. Important reductions may be obtained by calculating the area with Karst geology where MB can be replaced by Metham Sodium and Pic. What percentage of US pepper production occurs in Karst geology?

US RESPONSE

In most cases the USG was unable to match information on Karst geology with growing areas of specific crops[3]. The best available information was used. Where site-specific information was available, it was used. Where such information was not available, the USG assumed that all crops grown in the state were independently and identically distributed across karst soils. In other words, the USG assumed that the proportion of each crop grown in karst soils was equal to the proportion of that state's agricultural land that comprised karst soils. For Florida, for example, approximately 40% of that State's agricultural land overlays karst topography[4], so 40% of each Florida crop forming part of the US nomination (tomatoes, strawberries, peppers…) is analyzed as if it is grown in an area overlaying karst topography. Although this procedure may be inaccurate with respect to a specific crop, because it accurately captures the overall proportion of agricultural land and thus agricultural crops where certain alternatives to methyl bromide cannot be used, it will give a correct total picture of methyl bromide need. Please see the answer on Question 4 as well.

[3] The exception is Dade County, Florida. By 1,3-D cannot be used in Dade County so that for purposes of the BUNI analysis, all of Dade County is treated as having karst topography.
[4] With the exception of Dade County (as noted above) which is treated as having 100% karst topography.

MBTOC QUESTION

9. Why strip fumigation is not adopted in all the US production areas?

US RESPONSE

Large scale field trials in the US have suggested that methyl bromide emissions are higher with strip treatments than with flat fumigation. When this issue was discussed during the U.S.-MBTOC bilateral in Prague, some members of MBTOC stated that they did not have field trial data on emissions comparing strip treatment and flat fumigation. In California strip treatments with methyl bromide are restricted by law because they lead to higher emissions. This demonstrates the complexity of the problem where strip treatments lead to lower use of methyl bromide but higher emission of the ozone depleting substance. If MBTOC is aware of relevant data the U.S. would greatly appreciate receiving the references so that it may be evaluated.

MBTOC QUESTION

10. Since 2000, in Michigan, about 5% of the acreage has been treated with the 50:50 formulation of methyl bromide and chloropicrin. What are the constraints to increase the use of this formulation? Is it possible to introduce or to increase the use of the formulation in the other states

US RESPONSE

USG has not been able to locate sufficient, credible, multiple year studies that indicate that this formulation is both technically and economically feasible under the circumstances described in the US nomination for this crop. If MBTOC is aware of such information USG would greatly appreciate receiving the references so that it may be evaluated.

MBTOC QUESTION

11. In Southern US and other states, Pepper is generally double-cropped with a cucurbit crop (muskmelon, cucumber, or squash). MB is applied every year. The requested quantity can decrease if MB is applied every two years, as for Michigan. Are there any constraints to adopt this frequency? The party presented also a CUN for cucurbits.

US RESPONSE

In the southern and southeastern US, pests include nutsedges that are aggressive colonizers and thus must be controlled every year (i.e. residual effects of fumigants, even with herbicides) do not last across two years. Here again, however, a situation similar to Michigan occurs: cucurbits are rotated with peppers and MB is applied during that rotation as well. However, the text of the CUN is incorrect about the Michigan frequency of fumigation. The BUNI correctly states that Michigan fumigates once per year.

MBTOC QUESTION

12. The MB formulation adopted is 67:33. Could the formulation 50:50 be adopted?

US RESPONSE

USG has not been able to locate sufficient, credible, multiple year studies that indicate that this formulation is both technically and economically feasible under the circumstances described in the US nomination for this crop. If MBTOC is aware of such information USG would greatly appreciate receiving the references so that it may be evaluated.

MBTOC QUESTION

13. One application of methyl bromide can last more than a year in California and therefore, the frequency of application is once every two years. Why MB in not applied every two years in other states?

US RESPONSE

In California, under moderate to severe pest pressure fumigations take place once every year. The key pests targeted by MB are disease pathogens and nematodes that are relatively more localized than in the other regions requesting MB for this crop. If MBTOC is aware of published research data demonstrating that California pepper growers fumigate less oftern than every year the U.S. would greatly appreciate receiving the references so that it may be evaluated.

MBTOC QUESTION

14. Locascio et al. (1997) conducted studies on MB alternatives on tomatoes grown in small plots at two Florida locations with high nutsedge infestation. Is there any similar reference for peppers? The yield decrease is probably caused by Fusarium and not by nutsedge.

US RESPONSE

There is no similar reference for peppers in the research literature, at least as it is available to USG. We would be interested in better understanding MBTOC's comment that the yield loss was probably caused by *Fusarium*, since this study involved a number of pests, including *Fusarium*, purple nutsedge, and root-knot nematodes. In at least one site there was moderate to heavy pest pressure from both *Fusarium* and purple nutsedge. These details were included in the description of this study in Section 16 for Southeastern region peppers.

MBTOC QUESTION

15. In California, has the area fumigated in 2003 increased or decreased?

US RESPONSE

According to statistics from the California Department of Pesticide Regulation (available at www.cdpr.ca.gov/docs/pur/pur03ep/chrmpt03.pdf), 751 acres (= 300 ha) of 'fruiting

peppers' were treated with methyl bromide in 2003. This is an increase over 2002 (when, according to the pepper nomination) 121 ha were treated).

MBTOC QUESTION

16. When the future plans to minimize MB use are expected to be adopted (VIF, drip irrigation, trials with new alternatives on pepper, MB formulation.)

US RESPONSE

USG does not have this information at present. Information relevant to this inquiry is being collected as part of the process to develop a U.S. management plan, which is to be submitted in 2006.

MBTOC QUESTION

17. The Party is requested to explain why no large-plot studies have yet been performed to show commercial feasibility of available alternatives in US peppers

US RESPONSE

USDA is working to obtain funding to support grant programs for methyl bromide alternatives to fund large plot trials. Thus far, it is our understanding that large-plot studies are being planned for in all the regions requesting MB for use on peppers in this nomination, but it is not clear when funding would become available to carry such studies out. US regulatory and research agencies have no legal authority to promote commercialization of alternatives explicitly, and indeed, would be prohibited from making recommendations of any sort until large-scale feasibility of MB alternatives had been demonstrated.

MBTOC QUESTION

18. Will the farm demonstration plots will be implemented in 2005? If yes, please give more details: number, distribution, alternatives etc.

US RESPONSE

We cannot state with certainty that farm demonstration plots will be implemented in 2005. However, as was stated above, it is our understanding that large-plot studies are being planned for in all the regions requesting MB for use on peppers in this nomination, contingent on funding and the cooperation of commercial growers being obtained.

To reiterate, US regulatory and research agencies have no legal authority to promote commercialization of alternatives explicitly, and indeed, would be prohibited from making recommendations of any sort until large-scale feasibility of MB alternatives had been demonstrated. As was noted in the text above, this requires completion of such studies by public and private entities outside USG regulatory agencies. USG regulatory agencies must work with fewer tools in this area than most other governments, as the US regulatory system has been designed to maintain more of a separation between private and public entities.

MBTOC QUESTION

19. The alternative implementation is scheduled for 2010. What will be the strategies to reduce the use and emission of MB during the coming years? (crop rotation, raised crop beds, black plastic, and foliar fungicides. Use of virtually impermeable film (VIF) etc.

US RESPONSE

Growers are using HDPE film and soil injection at the minimally acceptable rates of methyl bromide to achieve adequate commercial control in order to minimize emissions and use of methyl bromide.

MBTOC QUESTION

20. What is the importance use of HDPE (high density polyethylene) to minimize use and emissions of MB.

US RESPONSE

Currently virtually all pepper growers using MB utilize HDPE to minimize emissions and amounts used of MB. It is thus of critical importance and is standard practice.

MBTOC QUESTION

21. What are the cultural practices used by the farmers to minimize use and emissions of MB.

US RESPONSE

HDPE plastic tarping after MB application, double cropping, strip bed fumigation (in some areas), and using a reduced rate (67:33) formulation of MB are all among the cultural practices used by pepper farmers to minimize use and emissions of MB.

US POST HARVEST NPMA
Foods and Food Processing Facilities

MBTOC reference: OzL./MBTOC-CUN/USA/MS/lm

MBTOC QUESTION

1. The CUN did not supply a list of food facilities, although the CUN says this information will be sent to MBTOC when available (page 9). MBTOC would welcome this list as part of understanding the needs for methyl bromide on a case-by-case basis and ensuring there is no duplication between this CUN and the one involving mills and other processing facilities. Table 6.1 page 8 notes that, although not listed, the food facilities are 'not included in other chapters'. Can the US government check this eventual list to ensure that a food processing facility listed as part of one CUN is not also included in another CUN? The list should specifically give reasons why MB alternatives are not feasible and/or why the dosages and frequency of treatment cannot be (further) reduced.

US RESPONSE

The US has ensured that no food processing facility is included in more than one CUN. The US has accomplished this by not allowing multiple groups to represent a single commodity/structure. For example, flour mills comprising part of the bakery request have been removed from the North American Millers Association (NAMA) request. USG has forwarded to MBTOC information on specific facilities, such as size, construction materials, USDA plant hardiness zone, etc. to assist MBTOC in its due diligence. Information on the specific location of each mill was not provided.

Since September 11, 2001, the USG has had a policy of not publishing the locations of food processing plants. This is to help maintain food security. As was stated in the critical use nomination, a full list of all processing plants that apply any registered pesticide in the U.S. is available from the U.S. Department of Labor, Occupational Safety and Health Administration website located at http://www.osha.gov/pls/imis/sicsearch.html. EPA's Facility Registry System is publicly available and is located at http://www.epa.gov/enviro/html/fii/ez.html

MBTOC QUESTION

2. Page 7 Facilities section indicates that food processing and commodities included in this CUN have decreased MB use through improved IPM, increased use of phosphine and spot heat. Fumigations are reported to have decreased from 4-6 times per year to an average of 2x/yr in the South and 1x/3-5 yr in the North (Page 8). Yet from Table 6.1 Page 8, reported volumes of MB treated space has remained essentially steady since 1998 (Volume treated average 1998 – 2002 was 7535 1000m3 and 2007 volume requested in the CUN is 7,868 1000m3). In terms of MB use, the 2007 request (BUNI figures) represents 67% of 2002 usage and 76% of 2001 usage. The two sets of information in the CUN do not appear to be in complete agreement. MBTOC

finds it difficult to conduct diligent analysis when the historical use data stops at 2002. When will recent historical use data be available?

US RESPONSE

Outside verification of historical data is not available for this sector. It does not contain commodities that are surveyed by USDA NASS. Even when these data are available they typically lag 2 years behind. When data arrives concerning this sector, it will be included in our nomination.

TABLE 6.1: METHYL BROMIDE CONSUMPTION FOR THE PAST 5 YEARS AND THE AMOUNT REQUESTED IN THE YEAR(S) NOMINATED FOR POST HARVEST USE (COMMODITES AND FACILITIES) NOT INCLUDED IN OTHER CHAPTERS*

	HISTORICAL USE*						REQUESTED USE
For each year specify:	**1998****	**1999**	**2000**	**2001**	**2002**	**2003****	**2007**
Amount of MB (kg)		220,300	219,616	193,149	217,636		189,050
Volume Treated (1000 m³)		7,020	8,037	6,791	8,293		7,868
Formulation of MB	The applicant did not provide any information on formulation						Unknown
Dosage Rate (kg/1000 m³)		24.03	24.03	24.03	24.03		24.03
Actual (A) Estimate (E)	Unknown						Unknown

*Based on most current information.
** No data from NPMA for 1998 & 2003.

MBTOC QUESTION

3. If we ignore 2006 CUN amounts since the Parties have not yet decided them, and look at the amounts of MB granted by the Parties for 2005, we see that the 2007 requested amount shows planned increased MB use for processed foods, cocoa, herbs and spices and cheese; the 'other foods' category represents a decrease. Increases in requested MB for 2007 is not in agreement with the CUN reporting that MB use has decreased through improved IPM, increased use of phosphine and spot heat treatment as reported in the point above. Please comment on why this industry needs increased critical MB in 2007 over 2005 amounts granted by the Parties.

US RESPONSE

Some errors were discovered in the computational methodology that have since been rectified. When the error was discovered, the US declined to call attention to this error and request additional methyl bromide for this sector in 2006. This has led to an apparent increase in the amount of critically needed methyl bromide for this sector for 2007.

MBTOC QUESTION

4. Table 9.1.b page 12 indicates that some facilities have low gastightness. This would result in increased methyl bromide use. For an MB use to be considered critical under Decision XI/6, all technically and economically feasible steps should have been taken to minimize the critical use and any associated emissions of MB. MBTOC views gastightness as an important facet of that aspect of assessment. What is the plan to improve gastightness of food processing facilities and commodity trailer fumigations this year?

US RESPONSE

In order to ensure that only critical uses of methyl bromide are nominated the U.S. has reduced the amount of methyl bromide nominated for post harvest uses to ensure more effective sealing of facilities and more efficient fumigant usage. In addition, the US is currently developing a Reregistration Eligibility Decision for preplant, post harvest and structural use of methyl bromide as part of a comprehensive assessment of all fumigants. As part of that assessment, worker and bystander risk assessments are being conducted. After the risks and hazards have been evaluated the U.S. will be discussing all methods, including gas tightness, as potential mitigation measures and methods to ensure the safe efficient and effective use of fumigants. The U.S.expects to conclude the reassessment of fumigants during the 2005 or early 2006 calendar year.

MBTOC QUESTION

5. Discussions about phosphine on page 7 and page 12 mention concern about phosphine resistant pests. Have phosphine resistant pests been reported in the US and in the facilities or commodities included in this CUN?

US RESPONSE

Phosphine resistance has been reported for at least nine species of moths and beetles that affect stored products. These species include: *Cadra cautella* (J. L. Zettler, W. R. Halliday and F. H. Arthur. 1989 Phosphine Resistance in Insects Infesting Stored Peanuts in South Eastern United States. Journal of Economic Entomology 82(6): 1508-1511.); *Lasioderma serricorne* (J. Larry Zettler and Dennis Weaver. 1994 Phosphine Resistance in Cigarette Beetle (Coleoptera: Anobiidae) Associated with Tobacco Storage in the Southeastern United States. Journal of Economic Entomology 87(3): 546-550.); *Rhizopertha dominica* and *Tribolium casteneum* (Zettler j. l., and G. W. Cuperus. 1990 Pesticide Resistance in Tribolium castenuem (Coleoptera: Tenebrionidae) and Rhyzopertha domenica (Coleoptera: Bostrichidae) in Wheat. Journal of Economic Entomology 83(5): 1677-1681): and *Tribolium confusum* (in Arkansas and Louisiana as documented in Georghiou, G. P. A., A. Lagunes-

Tejeda. 1991 The Occurrence of Resistance to Pesticides in Arthropods: An Index of Cases reported through 1989.) This latter source also documents resistance to additional species and in countries outside of the US.

MBTOC QUESTION

6. Section 17.1 Research page 20 and 21 does not seem to report research on the food facilities and commodities included in this CUN, but does report research included in the other CUN for food processing facilities also submitted by the US (e.g. rice milling, bakeries). Is it possible that the appropriate section for this CUN was inadvertently lost or not included? The facilities and commodities included in this CUN are likely to be different than the other CUN in terms of heat generating capacity, improved sanitation and structures (resulting from operating under HACCP processing for processed foods) and other factors. Has research been conducted on adopting and adapting MB alternatives for the types of facilities and commodities included in this CUN?

US RESPONSE

The USG is not aware of any such research.

MBTOC QUESTION

7. Please clarify whether the amount requested for herbs and spices is for the herb and spice processing structure or the commodity.

US RESPONSE

It is for both the structure and the commodity. Most herb and spice processing takes place in the same room or structural area as the incoming commodities and the finished products are stored.

MBTOC QUESTION

8. The US FDA requires that a large volume of the cocoa beans landing for import to the US be disinfested because of pests found on inspection or because the exporting countries has been found to consistently send infested cocoa to the US (i.e. mandatory detention by the FDA). Has the US government made a determination that the volume of cocoa beans treated with methyl bromide as a result of its automatic detention by US FDA is not a QPS treatment?

US RESPONSE

The US has not made a determination as to the QPS status of the commodities identified by the MBTOC. The US will carefully work with the commodity group and our sister agencies to review the various regulations and determine if some portion of cocoa may qualify as QPS for next year's CUN.

MBTOC QUESTION

9. Is cheese sometimes present in the stores and sometimes not present? If there are times when cheese is not present in the cheese stores, what avenues are being explored to adapt and adopt other alternatives when the cheese stores do not contain cheese? Are other alternatives registered to be used when the cheese is not in the cheese stores? Can improvements in IPM and use of alternative treatments such as heat be used on the cheese stores when cheese is not present to result ensure the stores stay disinfested when the cheese is present?

US RESPONSE

Cheese is always present when a fumigation is needed. Inspectors find cheese mites on cheese. If there was no cheese present, they would not need to fumigate. If there were no cheese present, they could treat (crack and crevice) the facility with organophosphate insecticides.

In the case of cheese mites, the cheese as well at the structure needs to be fumigated, which is the main reason for requesting this critical use exemption.

MBTOC QUESTION

10. Foods in the 'other foods' category are reported to include tea on pallets, coffee beans, tomatoes, bell peppers, citrus and cassava (Table A1 page 8). Are these items all dry commodities? If so, could they be treated with ethylene oxide gas or irradiated under US regulations? If they are dry commodities is there marketing or time pressure that prevents the use of phosphine and is phosphine registered for this use?

US RESPONSE

Not all of the 'other foods' are dried commodities (tomatoes, bell peppers, citrus and cassava, for example) and would not be suitable for treatment with ethylene oxide. From the descriptions provided to us it appears that these are small shipments to different locations. This would require several radiation facilities that would be expensive to license and operate on a low volume basis.

MBTOC reference: OzL./MBTOC-CUN/USA/MS/gao

US STRAWBERRY FRUIT

Data on MB usage

MBTOC QUESTION

1. On page 38, the dosage rate of MB active ingredient in kg/ha in 2003 is shown as increased to 24.7kg/ha from 18.5kg/ha in the previous year. The Party is requested to provide MBTOC with information on the reason why.

US RESPONSE

The USG does not have this information. This information pertains to the years prior to the period during which critical use exemptions are required for methyl bromide consumption. During the time covered by this request the US, like many countries, attained compliance with the Montreal Protocol by setting overall limits on consumption and production, as opposed to monitoring/limiting MB use on a sector by sector basis. It did not require a particular reduction strategy, such as fumigating fewer hectares, using lower use rates, etc., be adopted.

MBTOC QUESTION

2. Page 11 stated that the formulation of MB/CP is 98:2 in Florida, while Page 76. stated is 67:33 or 50:50. Which formulation is correct?

US RESPONSE

MBTOC is correct that the formulation described on pages 11 and 76 do not agree. In the application information the consortium state that the downward trend in methyl bromide use is due to a transition from the 98:2 formulation to the 67:33 formulation. The nomination requested methyl bromide in areas with moderate to severe pest pressure. The U.S. nomination took into account that many areas in Florida that have sting nematode (*Belonolaimus* spp.) problems, which require a higher concentration of methyl bromide. Therefore, the nomination would assume that growers with nematode problems would tend to use a higher percent concentration of methyl bromide and those growers without nematodes or low nematode problems would use a lower concentration of methyl bromide.

MBTOC QUESTION

3. The CUN does not explain fully why this sector cannot adopt 50:50 MB/Pic in Florida and eastern states, and 57:43 (or 50:50 if registered) in California.

US RESPONSE

U.S. has not been able to locate sufficient, credible, multiple year studies that indicate that this mixture is both technically and economically feasible in the circumstances of the U.S. nomination. If MBTOC is aware of such information the U.S. would greatly appreciate receiving the references so that it may be evaluated.

MBTOC QUESTION

4. What statistics are available on the use of 1,3-D, chloropicrin, metham, other combinations of fumigants or chemicals, and other types of alternatives, for strawberry fruit in Florida, California and eastern states for 2002, 2003 and 2004? MBTOC would appreciate information on recent trends.

US RESPONSE

The publicly available information on pesticide use and usage is available from the U.S. Department of Agriculture. The U.S.D.A., National Agricultural Statistics Service (NASS) conducts surveys to evaluate pesticide use and usage in a number of crops in the U.S. NASS does an excellent job of collecting and distributing such information for major field crops (corn, cotton, rice, soybeans, and wheat). Unfortunately, for minor crops such as strawberries they are not able to devote the resources necessary to accurately estimate these uses. In addition minor crops are not surveyed every year and not all states are surveyed. That information is available at: http://www.pestmanagement.info/nass/index.html .

VIF

MBTOC QUESTION

5. VIF has been in commercial use in most regions of the EC for several years, because it has been a legal requirement for four years. Substantial trials were conducted in several countries and climates. At this stage, there is little technical justification for not adopting VIF, since there is substantial practical experience with this technology in many different types of cropping systems. What are the limiting impediments (if any) to the widespread adoption of this proven emission reduction technology?

US RESPONSE

Large scale field trials in the U.S. have not demonstrated a reduction in emissions when using high barrier or VIF films. During bilateral US-MBTOC discussions in Prague on this matter we understood that MBTOC also did not have field trial data on emissions comparing VIF to other types of film. The permeability of films under laboratory conditions has been tested. However, under field conditions emission rates do not appear to be reduced. If MBTOC is aware of such information the U.S. would greatly appreciate receiving the references so that it may be evaluated.

Economic Issues

MBTOC QUESTION

6. Concerning table 21.1, table 22.1 and table E.1,E.2 andE.3:

(1) Please check the accuracy of Table 21.1 (copied in Annex 2 below). Are the operating costs the same for methyl bromide and other alternatives? Are the operating costs the same over three years? For example, in this period it is likely that the cost of MB will increase. Please provide the actual costs in 2004 and 2005 and estimated cost in 2006.

(2) Concerning Table E.1 (Page 50) for California, if the figure of table 21.1 is as it is, the figure of table E.1 should be changed as shown in red colour in Annex 2 below. Please check it whether it is appropriate or not.

(3) Concerning the Table E.2 (Page 51) for Florida and Eastern United States, figures should be changed to the ones written in red below.

US RESPONSE

(1) The operating costs are not the same for methyl bromide and other alternatives. The costs vary depending on the alternative analysed. The operating costs, gross and net revenues for years 1, 2, and 3 do not change because all the calculations were based on an average of three years (2001~2003). An average better reflects normal fluctuations in the market. The corrected table is below in Tables 21.1 & 22.1. The information also reflects a representative grower of the particular crop given the number of growers throughout the US. Economic data are provided mainly through University Crop Budgets or Enterprise Budgets and also reflect a representative grower. The information included in the nomination is the most current information that is accessible at the time of the preparation of the nomination packages. There is a time lag on survey information of approximately 2 years; therefore the prices for 2004 and 2005 are not available. Given that demand is being restricted through the CUN process, it is not clear that the price of methyl bromide will rise. In any case, the US is not able to predict a future price for 2006.

(2) The corrected Economic Impacts table is below in Table E.1

(3) The corrected Economic Impacts tables are below in Tables E.2 & E.3. All losses are calculated against methyl bromide. Loss per hectare is calculated as the difference between the methyl bromide net revenue and the alternative net revenue. Loss as a Percentage of Gross Revenue is calculated as the loss per hectare of the alternative divided by the gross revenue using methyl bromide.

CORRECTED TABLE 21.1: OPERATING COSTS OF ALTERNATIVES COMPARED TO METHYL BROMIDE OVER 3-YEAR PERIOD

REGION	ALTERNATIVE	YIELD*	COST IN YEAR 1 (US$/ha)	COST IN YEAR 2 (US$/ha)	COST IN YEAR 3 (US$/ha)
California	**Methyl Bromide**	**100%**	**$64,266**	**$64,266**	**$64,266**
	Chloropicrin + Metham sodium	73%	$65,093	$65,093	$65,093
	1,3-D + chloropicrin	86%	$65,189	$65,189	$65,189
	Metham Sodium	70%	$64,944	$64,944	$64,944
Florida	**Methyl Bromide**	**100%**	**$44,254**	**$44,254**	**$44,254**
	1,3-D + chloropicrin	86%	$43,030	$43,030	$43,030
	Chloropicrin + Metham Sodium	73%	$39584	$39584	$39584
	Metham Sodium	70%	$38,818	$38,818	$38,818
Eastern United States	**Methyl Bromide**	**100%**	**$29,482**	**$29,482**	**$29,482**
	Chloropicrin + Metham sodium	73%	$30,406	$30,406	$30,406
	1,3-D + chloropicrin	86%	$31,509	$31,509	$31,509
	Metham Sodium	70%	$30,122	$30,122	$30,122

* As percentage of typical or 3-year average yield, compared to methyl bromide.

CORRECTED TABLE 22.1: YEAR 1, 2, 3 GROSS AND NET REVENUE

YEAR 1, 2, 3			
REGION	**ALTERNATIVES** (as shown in question 21)	**GROSS REVENUE FOR LAST REPORTED YEAR** (US$/ha)	**NET REVENUE FOR LAST REPORTED YEAR** (US$/ha)
California	**Methyl Bromide**	**$84,787**	**$20,521**
	Chloropicrin+ Metham sodium	$53,229	($11,864)
	1,3-D chloropicrin	$72,917	$7,728
	Metham Sodium	$37,261	($27,733)
Florida	**Methyl Bromide**	**$55,168**	**$10,914**
	1,3-D + chloropicrin	$47,224	$4,194
	Chloropicrin + Metham Sodium	$40,273	$689
	Metham Sodium	$38,728	($90)
Eastern United States	**Methyl Bromide**	**$51,892**	**$22,410**
	Chloropicrin+ Metham sodium	$37,881	$7,475
	1,3-D chloropicrin	$44,608	$13,099
	Metham Sodium	$36,324	$6,203

CORRECTED CALIFORNIA - TABLE E.1: ECONOMIC IMPACTS OF METHYL BROMIDE ALTERNATIVES

CALIFORNIA	METHYL BROMIDE	PIC+METAM SODIUM	1,3-D+PIC	METAM SODIUM
YIELD LOSS (%)	0%	27%	14%	30%
YIELD PER HECTARE (FRESH)	47,476	29,806	40,830	20,864
* PRICE PER UNIT (US$)	$1.56	$1.56	$1.56	$1.56
YIELD PER HECTARE (PROCESSED)	16,183	10,160	13,918	7,112
* PRICE PER UNIT (US$)	$0.67	$0.67	$0.67	$0.67
= GROSS REVENUE PER HECTARE (US$)	$84,787	$53,229	$72,917	$37,261
- OPERATING COSTS PER HECTARE (US$)	$64,266	$65,093	$65,189	$64,994
= NET REVENUE PER HECTARE (US$)	$20,521	$(11,864)	$7,728	$(27,733)
LOSS MEASURES				
1. LOSS PER HECTARE (US$)	$0	$32,385	$12,794	$48,254
2. LOSS PER KILOGRAM OF METHYL BROMIDE (US$)	$0	$161	$64	$241
3. LOSS AS A PERCENTAGE OF GROSS REVENUE (%)	0%	38%	15%	57%
4. LOSS AS A PERCENTAGE OF NET REVENUE (%)	0%	158%	62%	235%

FLORIDA - TABLE E.2: ECONOMIC IMPACTS OF METHYL BROMIDE ALTERNATIVES

FLORIDA	METHYL BROMIDE	1,3-D+PIC	PIC+METAM SODIUM	METAM SODIUM
YIELD LOSS (%)	0%	14%	27%	30%
YIELD PER HECTARE	5,046	4,319	3,683	3,542
* PRICE PER UNIT (US$)	$10.93	$10.93	$10.93	$10.93
= GROSS REVENUE PER HECTARE (US$)	$55,168	$47,224	$40,273	$38,728
- OPERATING COSTS PER HECTARE (US$)	$44,254	$43,030	$39,584	$38,818
= NET REVENUE PER HECTARE (US$)	$10,914	$4,194	$689	($90)
LOSS MEASURES				
1. LOSS PER HECTARE (US$)	$0	$6,720	$10,225	$11,004
2. LOSS PER KILOGRAM OF METHYL BROMIDE (US$)	$0	$33	$51	$55
3. LOSS AS A PERCENTAGE OF GROSS REVENUE (%)	0%	12%	19%	20%
4. LOSS AS A PERCENTAGE OF NET REVENUE (%)	0%	62%	94%	101%

EASTERN UNITED STATES - TABLE E.3: ECONOMIC IMPACTS OF METHYL BROMIDE ALTERNATIVES

EASTERN UNITED STATES	METHYL BROMIDE	PIC+METAM SODIUM	1,3-D+PIC	METAM SODIUM
YIELD LOSS (%)	0%	27%	14%	30%
YIELD PER HECTARE	22,417	16,364	19,270	15,692
* PRICE PER UNIT (US$)	$2.31	$2.31	$2.31	$2.31
= GROSS REVENUE PER HECTARE (US$)	$51,892	$37,881	$44,608	$36,324
- OPERATING COSTS PER HECTARE (US$)	$29,482	$30,406	$31,509	$30,122
= NET REVENUE PER HECTARE (US$)	$22,410	$7,475	$13,099	$6,203
LOSS MEASURES				
1. LOSS PER HECTARE (US$)	$0	$14,934	$9,311	$16,207
2. LOSS PER KILOGRAM OF METHYL BROMIDE (US$)	$0	$99	$62	$107
3. LOSS AS A PERCENTAGE OF GROSS REVENUE (%)	0%	29%	18%	31%
4. LOSS AS A PERCENTAGE OF NET REVENUE (%)	0%	67%	42%	72%

MBTOC QUESTION

7. What prices and doses were used for each alternative chemical product in the economic tables? What are the current commercial prices of these products in 2005, in each region?

US RESPONSE

The information included in the nomination is the most current information that is accessible at the time of the preparation of the nomination packages. There is a time lag on survey information of approximately 2 years; therefore the prices for 2004 and 2005 are not available.

Efficacy / yield loss

MBTOC QUESTION

8. Could the Party please indicate the treated area percent proportion compared to one hectare in Eastern USA and Florida with bed/strip treatment system? Is MB bed/strip treatment effective for the control of nematodes and nutsedge?

US RESPONSE

There is a wide range of cultural practices and production practices including bed width and percent of the field treated when using strip treatments in the eastern U.S. and Florida. The U.S. does not have statistics on the treated area percent proportion compared to one hectare. Methyl bromide is considered the only technically and economically feasible fumigant for those eastern and Florida growers as described with moderate to severe pest pressure such as: Black root rot, Crown rot, Root knot nematode, perennial sedge, ryegrass, Carolina geranium, and cut-leaf evening primrose. Many of these growers consider a bed or strip treatment using methyl bromide and chloropicrin to be a technically and economically effective strategy.

MBTOC QUESTION

9. In Table 16.1 on effectiveness of alternatives for 'key pest 1 yellow nutsedge' (page 21-22) the first study indicated that MB/CP (at 392 kg/ha) gave no significant difference in native weed biomass compared with alternatives chloropicrin and 1,3-D/CP (especially at higher rates, and/or with VIF), in control of 'Key pest yellow nutsedge'. The second and third study in Table 16.1 indicated that certain doses of alternatives, chloropicrin, 1,3-D/CP and MS (35 gal drip) provided higher yield than MB/CP. However, the estimates of yield loss in Table C.1 in California, eastern states and Florida (pages 23, 33 and 43) appear to be taken only from Shaw and Larson (1999) and Locascio (1999). More recent studies, using improved application methods and other combinations of fumigants/chemicals have been carried out since that time. Such studies, using the better application methods and know-how currently available, should form the basis for the yield analysis.

US RESPONSE

The U.S. has evaluated many research studies comparing the relative efficacy of fumigants and combination treatments. The U.S. relies primarily on studies that include methyl bromide as a comparative standard, present information on pest pressure, and collect harvest information. Unfortunately, many relevant studies do not include this type of information, which makes the interpretation of that data a very imprecise art. In addition to yield and performance issues regulatory constraints (e.g. chloropicrin is not registered in France, California Township caps, restrictions on use of Telone on karst geology) directly influence the ability of growers to adopt alternatives.

Steep Slopes

MBTOC QUESTION

10. On steep slopes, it is feasible to use shank injection for alternative fumigants. This is the method currently used for MB, according to the CUN (page 15). The CUN does not adequately explain why shank injection could not be used for alternatives on steep slopes.

US RESPONSE

In California the best available alternative to methyl bromide is considered to be 1,3-dichloropropene (1,3-D) mixed with chloropicrin. However, the California township cap is calculated based on the amount of 1,3-D applied times an application multiplier factor, which

is used to account for the different emissions using different application techniques. The adjusted total application (ATP) in California is calculated using an application factor (AF) of 1.16 for 1,3-D in a drip application system[1]. The application factor for 1,3-D using mechanical soil injection is 2.3 (when applied less than 18 inches deep). Therefore, converting from a drip application system to mechanical soil injection has a two-fold increase in the adjusted total application calculation and means that only one half as much 1,3-D can be used if the township is near its cap. In addition, mechanical injection applications are less effective at controlling pests under California conditions.

[1] Recommended Permit Conditions for Using 1,3-Dichloropropene Pesticides (Fumigant) Available at http://www.cdpr.ca.gov/docs/enfcmpli/penfltrs/penf2002/2002atch/attach37.pdf.

Dates of planting, harvest, rotational crops

MBTOC QUESTION

11. Please provide more precise dates of planting and harvest (start / finish) and key market windows for: Northern California, southern California, Florida and eastern states. Where rotational crops are common, please identify them and provide planting and harvest dates, for each region.

US RESPONSE

There are approximately 20,000 hectares of strawberries grown in the U.S. Not all of which have requested the use of methyl bromide. Because of the large area and the hundreds of growers involved a precise listing of planting, harvest dates, key market windows, rotational crops with planting and harvest dates is not available. For example the U.S. estimates there are over 600 strawberry growers in California, they plant during five months of the year. Providing precise planting and harvest dates is very difficult to describe. The same holds true for describing the potential rotational crops for just those 600 California strawberry growers. The U.S. included Table 11.2 for each of the growing regions to help describe this information. If MBTOC could provide a detailed description of how the information will be used or provide examples how other countries have presented the information the U.S. would attempt to better describe the situation of the nomination.

Nutsedge

MBTOC QUESTION

12. Could the Party please give more information about the way in which nutsedge propagates or is spread? MB itself provides incomplete control. Which cultural control practices have been investigated for nutsedge control in strawberry fruit?

US RESPONSE

The U.S. will forward a presentation by Dr. Theodore M.Webster describing the propagation and colonization of nutsedge. Webster, Theodore M. 2005. Should I stay or should I grow? The nutsedge dilemma in polyethylene mulch systems. USDA-ARS, Tifton, GA. A presentation to the Southern Weed Science Society in Charlotte, NC January 26, 2005.

A wide variety of cultural control practices have been evaluated for nutsedge control including: crop rotation, mechanical soil cultivation, fallow period, etc. This information is presented in California, Eastern U.S., and Florida Table 13.1 of the Nomination. If MBTOC has detailed information detailing incomplete control versus complete control of yellow and purple nutsedge "MB itself provides incomplete control" using methyl bromide the U.S. would appreciate a copy of that information.

MBTOC QUESTION

13. Why is it not considered feasible to use herbicides to control nutsedge before transplanting strawberry? The CUN does not provide a detailed update on progress in examining and registering herbicides for the control of nutsedge in strawberry fruit. Please provide an update.

US RESPONSE

It is not clear if MBTOC is requesting information on the use of preemergence or postemergence herbicides prior to strawberry transplanting so we will describe both situations for the Eastern U.S. and Florida situations. Nutsedge is a warm season perennial weed. Strawberry fields in Florida and the Eastern U.S. are generally planted in the fall after temperatures have dropped and the nutsedge plants are not as actively growing and herbicides are not as readily taken up. Post emergence herbicides (e.g. glyphosate) are used by some growers for nutsedge control prior to land preparation. But not all growers have enough time to spray the herbicide and allow enough time for undisturbed growth of the plants to allow uptake and translocation to the underground tubers (nutlets) prior to preparing the fields to grow strawberries. The extra time, for herbicide application, uptake, translocation, and inhibition of the tubers, would potentially be two to four weeks and would require that the previous crop be destroyed several weeks early with the resulting economic loss. Preemergence herbicides must selectively control the nutsedge and not cause phytotoxicity to the strawberry plants. Some of the newly registered sulfonyl urea herbicides are not as effective for control of nutsedge preemergence as they are postemergence.

It appears from the nature of the question that MBTOC may have a specific herbicide in mind when tasking this question about strawberries. If MBTOC could indicate the specific herbicide in question, the U.S. could describe the situation more completely.

Nematicides

MBTOC QUESTION

14. Fosthiazate, a nematicide, was registered by USEPA a couple of years ago. The Party is requested to provide MBTOC with the information on registration and deployment in the strawberry industry, in each relevant region (California, Florida, eastern US).

US RESPONSE

Because of the small size of the strawberry market and the recent registration of fosthiazate the USDA and California Dept. of Pesticide Regulation do not have any use and usage statistics available for this nematicide.

Supporting data on area affected by moderate to severe pest pressure

MBTOC QUESTION

15. The previous CUN stated that the area (hectares) affected by moderate to severe key pests (eg. nutsedge) was derived from informal sources such as websites, discussions with researchers and growers etc. Is additional data now available to substantiate these informal sources? Have any surveys been carried out on the extent and severity of key target pests that form the basis of the CUNs in (a) Florida, (b) eastern states, and (c) California? If so, MBTOC would be grateful to receive copies of the detailed survey results.

US RESPONSE

The US does not have new information on extent of pest pressure and is unable to develop this information. In order to design and develop an accurate survey an extensive knowledge base would have to be developed on the growers, geography, state and county borders in relation to farms, and biology of all the target pests. There are the additional issues concerning pest identification and verification because when conducting a survey of growers the nomenclature of pests, and common names can vary across the country. To determine the pests present in a site (e.g. Phytophthora citricola, P. cactorum, Belonolaimus longicaudatus or Meloidogyne spp.) field sampling would be required with numerous samples per field and extensive laboratory analysis. After a survey instrument is developed funding would need to found to administer, collect, calculate and summarize the information. In addition to the time and money needed to develop a survey instrument the U.S. must fulfill additional requirements for surveys. The entire process to develop and implement a survey is very time and resource intensive. The U.S. requests that MBTOC describe how other countries have provided this information on a county basis to see if there are other ways in which to provide the information.

Regulatory Restrictions on 1,3-D

MBTOC QUESTION

16. MBTOC recognizes that regulatory restrictions restrict the use of 1,3-D in certain regions. Some other fumigants/chemicals have been found effective in controlling the key nematode species affecting strawberry fruit production. To what extent can these techniques be adopted in the areas where 1,3-D cannot be used for regulatory reasons? Please re-calculate the CUN tonnage to take full account of other available treatments/combinations in areas affected by regulatory restrictions on 1,3-D.

US RESPONSE

It appears from the nature of the question that MBTOC may have a specific fumigant chemical combination in mind when tasking this question about strawberries. If MBTOC could provide the name of the specific fumigant and chemical combination in question the U.S. could describe the situation more completely. For example in the case of metam sodium the control of nematode species under the circumstances of the nomination has been very

inconsistent. It is unclear what chemicals would be added to a fumigant to increase its nematicidal activity. During US-MBTOC bilaterals over the past several years, we haven't been able to obtain from MBTOC any data on nematode control relevant to the circumstances of the U.S. nomination so that we could further consider it in this context. If MBTOC has detailed information on overall performance of a fumigants/chemicals for the control of nematodes such as root knot nematode (*Meloidogyne* spp.) and sting nematode (*Belonolaimus* spp.) the U.S. would appreciate a copy of that information.

MBTOC QUESTION

17. Are there different definitions for 'karst geology' and 'karst topography'? The CUN cites a Registration Eligibility Decision for 1,3-D from 1998 (page 45). We understand that some label changes were proposed relating to karst topography. Have any changes been made in the federal, state or county restrictions, labels or other controls relating to karst geology/topography in the last few years? If so, what are the current restrictions relating to karst? If these changes will mean that 1,3-D can be used on a larger area than estimated in the CUN, please provide up-dated calculations of hectares.

US RESPONSE

There have been no changes in the Federal label language for 1,3-Dichloropropene (Telone™) regarding the karst geology versus karst topography language. If approved those label changes would have to be evaluated to determine the impact on 1,3-D usage.

Information relating to potential adoption time (Annex I of Prague MOP)

MBTOC QUESTION

18. For each region (California, Florida and eastern states), please estimate: (a) the number of fumigation companies that currently provide MB fumigation services to growers, (b) the estimated number of growers in each region, and (c) the number and types of government and private training and extension facilities and personnel available to the strawberry sector.

US RESPONSE

There is no federal registration of fumigation companies to collect this information from. According to the U.S. Census of Agriculture for 2002 there are 55,856 acres of strawberries grown in the U.S. on 6,799 farms (available at http://www.nass.usda.gov/census/). The individual listing of acreage and farms by state is also available at that website. Please be aware that this is survey data and not census data so many minor crops and state are not always accurately reflected in these numbers. The U.S. does not have any information on the number and types of training and extension personnel in all growing regions and is unable to develop this information. If MBTOC could describe how other countries have answered this question the U.S. could see if there are other types of information that could be provided to MBTOC.

Other Information

MBTOC QUESTION

19. If you are aware of any additional information that would assist MBTOC/TEAP to make a complete technical and economic evaluation of the CUN, as defined in Decision IX/6, we would be very grateful to receive the information.

US RESPONSE

In several instances MBTOC has mentioned supporting data they have from other situation and countries, but in only once case have we been supplied with those references. Without the supporting information the U.S. finds it difficult to fully answer questions or to be certain we had the right sense of what the intent of the question is. We are doing our best to facilitate an open and transparent exchange of information, and would be appreciative if MBTOC would provide the data that supports or is relevant to their questions and comments.

ANNEX 1

AMOUNT OF MB USED/REQUESTED, NO OF YEARS REQUESTED & HISTORIC USE:

_____	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*Formulation*	*Proportion of Use*
California	*1,928*	*2,264*	*1.919*	*1,611*	*1,592*	*1,651*			*087*	*Mostly 67:33 (Flat Fume)*	
MB Dosage rate g/m²	*26*	*27.5*	*24.4*	*19.1*	*20.1*	*20.1*			*0.1*		
MB+CP Dosage rate g/m²	*38.8*	*41.0*	*36.4*	*28.5*	*30.0*	*30.0*					
Eastern USA	*317*	*239*	*254*	*274*	*283*	*320*			*230*	*67:33 (Bed)*	
Dosage rate g/m²	*22*	*15.1*	*15.0*	*15.1*	*15.1*	*15.1*			*15.1*		
MB+CP Dosage rate g/m²	*32.8*	*22.5*	*22.4*	*22.5*	*22.5*	*22.5*					
Florida	*551*	*464*	*471*	*486*	*516*	*708*			*296*	*98:2 (strip)*	
Dosage rate g/m²	*22.0*	*18.5*	*18.8*	*18.5*	*18.5*	*24.7*			*18.5*		
MB+CP Dosage rate g/m²	*22.4*	*18.9*	*19.2*	*18.9*	*18.9*	*25.2*					

ANNEX 2

21. OPERATING COSTS OF ALTERNATIVES COMPARED TO METHYL BROMIDE OVER 3-YEAR PERIOD:

TABLE 21.1: OPERATING COSTS OF ALTERNATIVES COMPARED TO METHYL BROMIDE OVER 3-YEAR PERIOD

REGION	*ALTERNATIVE*	*YIELD**	*COST IN YEAR 1* *(US$/ha)*	*COST IN YEAR 2* *(US$/ha)*	*COST IN YEAR 3* *(US$/ha)*
California	***Methyl Bromide***	***100%***	***$65,888***	***$65,888***	***$65,888***
	Chloropicrin + Metham sodium	*73%*	*$65,683*	*$65,683*	*$65,683*
	1,3-D + chloropicrin	*86%*	*$65,664*	*$65,664*	*$65,664*
	Metham Sodium	*70%*	*$65,684*	*$65,684*	*$65,684*
Florida	***Methyl Bromide***	***100%***	***$44,254***	***$44,254***	***$44,254***
	1,3-D + chloropicrin	*86%*	*$43,030*	*$43,030*	*$43,030*
	Chloropicrin + Metham Sodium	*73%*	*$39584*	*$39584*	*$39584*
	Metham Sodium	*70%*	*$38,818*	*$38,818*	*$38,818*
Eastern United States	***Methyl Bromide***	***100%***	***$29,482***	***$29,482***	***$29,482***
	Chloropicrin + Metham sodium	*73%*	*$30,555*	*$30,555*	*$30,555*
	1,3-D + chloropicrin	*86%*	*$31,658*	*$31,658*	*$31,658*
	Metham Sodium	*70%*	*$30,270*	*$30,270*	*$30,270*

** As percentage of typical or 3-year average yield, compared to methyl bromide.*

22. GROSS AND NET REVENUE

TABLE 22.1: YEAR 1, 2, 3 GROSS AND NET REVENUE

YEAR 1, 2, 3			
REGION	*ALTERNATIVES* *(as shown in question 21)*	*GROSS REVENUE FOR LAST REPORTED YEAR* *(US$/ha)*	*NET REVENUE FOR LAST REPORTED YEAR* *(US$/ha)*
California	***Methyl Bromide***	***$76,252***	***$10,363***
	Chloropicrin+ Metham sodium	*$55,664*	*($10,020)*
	1,3-D chloropicrin	*$65,548*	*($3,840)*
	Metham Sodium	*$53,376*	*($12,307)*
Florida	***Methyl Bromide***	***$55,168***	***$10,914***
	1,3-D + chloropicrin	*$47,224*	*$4,194*
	Chloropicrin + Metham Sodium	*$40,273*	*$689*
	Metham Sodium	*$38,728*	*($90)*
Eastern United States	***Methyl Bromide***	***$51,892***	***$22,410***
	Chloropicrin+ Metham sodium	*$37,881*	*$7,327*
	1,3-D chloropicrin	*$44,608*	*$12,950*
	Metham Sodium	*$36,624*	*$6,054*

MEASURES OF ECONOMIC IMPACTS OF METHYL BROMIDE ALTERNATIVES

CALIFORNIA - TABLE E.1: ECONOMIC IMPACTS OF METHYL BROMIDE ALTERNATIVES

CALIFORNIA	*METHYL*	*PIC+METHA*	*1,3-D+PIC*	*METHAM*

	Bromide	m Sodium		Sodium
Yield Loss (%)	0%	27%	14%	30%
Yield per Hectare (Fresh)	48,438	35,359	41,639	33,906
* Price per Unit (US$)	$1.71	$1.62	$1.62	$1.62
= Gross Revenue per Hectare (US$)	$76,252	$55,684	$65,548	$53,376
- Operating Costs per Hectare (US$)	$65,888	$65,888	$65,888	$65,888
= Net Revenue per Hectare (US$)	$10,364	$-10,204	$-340	$-12,515
Loss Measures				
1. Loss per Hectare (US$)	$0	17,792	11,817	19,474
2. Loss per Kilogram of Methyl Bromide (US$)	$0	88.19	58.57	96.52
3. Loss as a Percentage of Gross Revenue (%)	0%	24%	16%	26%
4. Loss as a Percentage of Net Revenue (%)	0%	131%	87%	144%

Florida - Table E.2: Economic Impacts of Methyl Bromide Alternatives

FLORIDA	Methyl Bromide	1,3-D+Pic	Pic+Metham Sodium	Metham Sodium
Yield Loss (%)	0%	14%	27%	30%
Yield per Hectare	5,046	4,319	3,683	3,542
* Price per Unit (US$)	$10.93	$10.93	$10.93	$10.93
= Gross Revenue per Hectare (US$)	$55,168	$47,224	$40,273	$38,728
- Operating Costs per Hectare (US$)	$44,254	$43,030	$39,584	$38,818
= Net Revenue per Hectare (US$)	$10,914	$4,194	$689	$—90
Loss Measures				
1. Loss per Hectare (US$)	$0	$6,720	$10,225	$11,004
2. Loss per Kilogram of Methyl Bromide (US$)	$0	$33	$51	$55
3. Loss as a Percentage of Gross Revenue (%)	0%	14.4%	27.0%	29.8%
4. Loss as a Percentage of Net Revenue (%)	0%	62%	94%	101%

Eastern United States - Table E.3: Economic Impacts of Methyl Bromide Alternatives

EASTERN UNITED STATES	Methyl Bromide	Pic+Metha m Sodium	1,3-D+Pic	Metham Sodium
Yield Loss (%)	0%	27%	14%	30%
Yield per Hectare	22,417	16,364	19,270	15,692
* Price per Unit (US$)	2.59	2.59	2.59	2.59
= Gross Revenue per Hectare (US$)	51,892	37,881	44,608	36,324
- Operating Costs per Hectare (US$)	29,482	30,555	31,658	30,270
= Net Revenue per Hectare (US$)	22,410	7,327	12,950	6,054
Loss Measures				
1. Loss per Hectare (US$)	$0	14,942	9,319	16,215
2. Loss per Kilogram of Methyl Bromide (US$)	$0	99.49	62.05	107.96
3. Loss as a Percentage of Gross Revenue (%)	0%	29%	18%	31%
4. Loss as a Percentage of Net Revenue (%)	0%	67%	42%	73%

US POST HARVEST FOOD FACILITIES

MBTOC reference: OzL./MBTOC-CUN/USA/MS/lm

MBTOC QUESTION

1. The amount of MB requested for 2007 represents an increase over 2006 (401,889 kg in 2007 versus 394,843 in 2006). MBTOC is aware of increased use of heat, sulfuryl fluoride and increased successes with IPM that decrease frequency of fumigation in addition to much new research that should be helpful to the industry. MBTOC thinks it is reasonable to expect some level of continued adoption of alternatives. Why then will an increased amount of MB be needed in 2007?

US RESPONSE

USG requested 505,982 kg in 2006 for use in this sector. MBTOC/TEAP recommended 394,843 kg, to which the USG has submitted a reconsideration of the difference between what was requested versus what was granted. Therefore, the USG is actually nominating less for 2007 than was nominated in 2006, and making a concerted effort to reduce methyl bromide use in this sector.

MBTOC QUESTION

2. The CUN did not supply a list of mill and food processing facility locations, although the CUN says this information will be sent to MBTOC when available (page 8). MBTOC would welcome this list as part of understanding the needs for methyl bromide on a case-by-case basis and ensuring there is no duplication between this CUN and the one involving NPMA-treated facilities. Can the US government check this eventual list to ensure that a food processing facility listed as part of one CUN is not also included in another CUN? The list should specifically give reasons why MB alternatives are not feasible and/or why the dosages and frequency of treatment cannot be (further) reduced.

US RESPONSE

USG has forwarded to MBTOC additional information on the facilities in this nomination. The information is for a subset of facilities and may not be representative of the entire set of facilities. The information includes the size, age, and construction of the original facility as well as the number of additions and the year the first addition was constructed. There is also information about climate (USDA plant hardiness zone) and pest management practices. The specific location of each facility has not been included.

The US has ensured that no food processing facility is included in more that one CUN. The US has accomplished this by not allowing multiple groups to represent a single commodity/structure. For example, flour mills comprising part of the bakery request have been removed from the North American Millers Association (NAMA) request. Flour mills that were part of the NPMA request have also been removed from the NPMA request as they are presumed to be included in

the NAMA request. If anything this procedure will result in under rather than over estimating the need for methyl bromide.

Since September 11, 2001, the USG has had a policy of not publishing the locations of food processing plants. This is to help maintain food security. As was stated in the critical use nomination, a full list of all processing plants that apply any registered pesticide in the U.S. is available from the U.S. Department of Labor, Occupational Safety and Health Administration website located at http://www.osha.gov/pls/imis/sicsearch.html. EPA's Facility Registry System is publicly available and is located at http://www.epa.gov/enviro/html/fii/ez.html

MBTOC QUESTION

3. Table B1 page 9, footnote says that some mills and food processing facilities in cooler locations are fumigated once every three years, whereas those in Southern US locations are fumigated twice a year (or 2.5 times per year as reported in table 9.1.a). In contrast Table B.2 page 10 footnote says rice mills are fumigated 5 x per year. The CUN reports that rice mills are in Southern US, where other mills such as wheat flour mills are also located. Flour mills in Southern US have been successful in reducing fumigation frequency from 4-6 times per year to current 2.5/yr (Part D13 page 16). So, the 5x/yr fumigation frequency for rice mills is remarkable. What is the technical justification for the higher frequency of fumigation in rice mills? What are the plans to reduce frequency of fumigation?

US RESPONSE

The costs of methyl bromide have reduced mill fumigation frequency. However some mills fumigate sections or bins at different times per year, accounting for a more frequent fumigation pattern than those mills that do the entire facility at each single fumigation .

Also in one instance, a mill using heat as an alternative found heat to be ineffectual and had to follow-up with MB to successfully rid the mill of pests, thereby increasing their frequency of methyl bromide use.

Plans to reduce the frequency of fumigation will be discussed in the management plan. Like other countries, the United States intends to submit its management plan to the Parties in 2006.

MBTOC QUESTION

4. Table 9.1: Page 10 notes variability in the need for fumigation of pet food establishments between 1/yr to 1/3-5 years and that only 80% of pet food establishments require fumigation. What MB alternatives do the other 20% and the pet food plants that do not require frequent fumigation use or are there other factors? MBTOC is aware of the use of spot heat treatment at a very large commercial pet food company. Why is heat, either as a whole site treatment or as a component if an IPM system, not considered technically and economically feasible for pet food establishments?

US RESPONSE

This applicant has worked with a number of firms in evaluating "heat treatments" in food plants. These treatments have been assessed in several areas of the country with different sized plants. Some facilities have been able to reduce methyl bromide usage by heat treating some areas and only fumigating warehouses and other areas where the heat is not feasible.

While heat treatments are quite successful in some facilities, they are not feasible for all. It is very difficult to hold required temperatures in an old building. Many structures were not designed for heat treatments (wood and old stone for example) and therefore are susceptible to costly structural and mechanical damage by the heat. Electrical wiring and circuit breakers must be rated for high temperature, and programmable controllers and MCC panels may not be within the treated area. Sprinkler systems must be rated at 212°F or higher. All wood legs and roll stand veneers have the possibility of damage due to humidity issues. Wooden sifters with damage prior to the heat treatment could experience intensified damage after a heat treatment. Heat treatments are known to cause damage at expansion joints, and to tile and other flooring material. A significant negative in pet food plants is that much of the commodity would have to be removed because of damage caused to food and food ingredients at temperatures near 140°F. Heat has very poor penetration and is difficult to equalize in all areas (hot and cool zones are common).

Heat treatments are realistic for most structures and most equipment *but not ingredients, commodities, dry pet food products and other materials***.** Heat treatments can be conducted in an effective, efficacious and economical manner for empty structures and equipment, especially if the heat source is available on site. If one has to rent and transport the necessary heat source to a site, then the economics may not be practical. For example, renting and mobilizing the necessary heat source to a job site has cost over $100,000 to do the same job that methyl bromide used to do for $20,000. Empty warehouses are important for heat treatments limiting the application area of using heat for insect control. Simply stated, exposing ingredients, commodities, dry pet food products and other materials to a lethal temperature of 130 degrees F. for a few hours will change the performance characteristic of that ingredient, commodity, dry pet food product or material. That change may be undesirable. Some examples; vitamin premix - vitamin A "evaporates" making the ingredient useless, wheat - dries out and will not mill effectively, corn flour - dries out and will not cook effectively, dry pet food - fat/oil will melt making product not saleable and packaging material - dries out becomes brittle and will not package efficiently, etc. Given these undesirable effects heat treatments have on ingredients, commodities, dry pet food products and other materials, they are not a viable alternative to methyl bromide for these particular applications. One example is that a plant in South Carolina, require**d** that the entire pet food plant be prepared empty for a heat treatment. This is not realistic so the company is trying to narrow down the heat treatment zone to the pre-extrusion area. The pre-extrusion milling ingredient handling area must also be prepared empty for an effective and economical heat treatment. This empty requirement, however, will probably prove to be an unrealistic approach to eliminating stored product insect pests in this portion of the pet food plant. It is important to note that insects will move to cooler zones to insulate themselves from lethal temperature. This insect response adds even more emphasis to the empty equipment, since a few pounds of material will create a micro insulating area insects will migrate towards. In addition, an increase in material for heat treatment creates a need for more heat source and subsequently higher costs.

Summary

In summary, heat treatments are feasible for pet food plants and continue to be considered as an IPM option. However, the preparation needed for an effective, efficacious and economical heat treatment may limit the application area. Heat treatments are not a realistic direct methyl bromide alternative for many ingredients, commodities, dry pet food products, food products and other materials. The industry is looking to conduct heat treatment trials in additional plants and to further incorporate heat treatments as part of an IPM program to reduce the volume of methyl bromide needed. But there are still many plants that the construction and layout of the plant make it totally unfeasible. Heat treatment along with other alternatives do not provide a complete replacement for methyl bromide and, even in plants that use heat treatments, there still may a need for methyl bromide as a last resort.

MBTOC QUESTION

5. Table 9.1: b Page 11 reports gastightness of the establishments included in this CUN. Rice mills are reported to be poor or very poor gastightness. In each other use category, a significant percentage of establishments are reported as very poor, poor or medium gastightness. Poor, very poor and even medium gastightness results in increased methyl bromide use (and may also create increased safety hazards from fumigant leakage). For an MB use to be considered critical under Decision XI/6, all technically and ecionomically feasible steps should have been taken to minimize the critical use and any associated emissions of MB. MBTOC views gastightness as an important facet of that aspect of assessment. What is the plan to improve gastightness of mills and reduce methyl bromide dosage and frequency for this year of nomination?

US RESPONSE

Unlike U.S. flour mills, which are primarily concrete, U.S. rice mills are constructed of a variety of materials, often times all used in one mill. This reflects how rice mills have been built and added onto over decades. These materials include metal, concrete, block, wood, fiberglass and, as stated, a mixture of all of the above. With most of these mills being in southern U.S. states, with summer temperatures reaching over 100 degrees plus humidity, the loose nature of the mills allow at least some ventilation into the structures for the workers.

These mills cannot be “tightened” without a complete rebuilding of the mill or its outer shell at a minimum. Such expense, reaching into the tens of millions of dollars for a mill replacement, is not economically feasible. Reskinning the outer shell of a mill is also an expense that is out of reach for most mills. In addition, tightening of the mills would reduce the already low ventilation creating a safety hazard for workers. Furthermore, fumigators use the same techniques for sealing regardless of the fumigant. One fumigant does not receive a special sealing over the other.

Regarding gastigtness, one U.S. rice mill owned a facility with such a loose structure that fumigants were not used. Instead the structure was subjected to heat treatments over the last several years with less than successful efficacy. The single structure was recently reskinned (at a cost of $598,000) in metal (roof and walls), and with heat failing as an alternative, the structure is now successfully sealed and fumigated with methyl bromide

MBTOC QUESTION

6. The CUN implies that heat treatment is unsuitable for bakeries because of the presence of butter and other heat sensitive foods We have assumed the paragraphs on page 5 and page 6 pertain to bakeries because butter and other high fat foods are more likely to be present in bakeries than in mills, rice mills and most food processing establishments but we know that fats are also present in pet food establishments. Butter and similar fats absorb methyl bromide substantially. In commercial practise in the U.S. are butter and similar fats actually present when a bakery is fumigated with methyl bromide? Are there food tolerances for methyl bromide and derived residues in butter and similar fats arising from fumigation? It is possible to remove heat sensitive foods outside of the bakery during a heat treatment, and it seems quite likely that bakeries have the heat capability or could withstand heat to 56°C as required. The CUN page 22 notes that some bakeries have already switched to heat and other alternatives. Using figures from the BUNI, bakery MB requested amount for 2007 is only 11 – 12% less than historical use in 2001 – 2002. Has the US government calculated its bakery MB requested amount in consideration of the switch to heat that has already occurred according to page 22, and that is likely to continue to occur between now and 2007?

US RESPONSE

When bakeries fumigate, food ingredients are removed from the areas of fumigation. Therefore, there are no concerns with rancidity, or Methyl Bromide residues. The USG has considered the extent to which bakeries can use heat treatment in calculating our request for a methyl bromide critical use exemption in this sector, and made our nomination accordingly.

MBTOC QUESTION

7. MBTOC would also like a discussion and justification for the apparent growth in requested MB by bakeries. The 2007 requested amount of 23,814 kg is compared to the 2006 amount of 14,742 kg in 2006. Unlike other BUNI's where growth in MB use is identified (and usually not allowed), the BUNI associated with this CUN does not identify or discuss this growth in use of MB for bakeries. Why has the need for MB increased from 2006 to 2007, especially since the CUN also says some bakeries are using alternatives? Why does the US, which in BUNI calculations for other CUNs, usually does not allow growth in MB use, seem to allow growth in bakery MB use in this instance?

US RESPONSE

Growth is not allowed without an acceptable explanation. In this case the requesting party documented that they have been working diligently to replace methyl bromide using a variety of other means including the use of heat treatments. Despite a strong commitment to replacing methyl bromide, the requesting party has concerns with the risks associated with long-term effects of heat upon the infrastructure and computerized equipment. In large manufacturing facilities, there is an additional issue of treating large cubic areas with heat where there is limited insulation, resulting in an inability to achieve and maintain temperatures needed for an effective kill step. Accordingly, the incremental volume to be treated reflects the addition of several large facilities where heat treatment was found to pose unacceptable risks.

US TOMATOES

MBTOC reference: OzL./MBTOC-CUN/USA/MS/gao

MBTOC QUESTION

1. Please discuss the suitability of 1,3-D + Pic injected in areas where field topography make it difficult to use drip application

US RESPONSE

In California the best available alternative to methyl bromide is considered to be 1, 3-dichloropropene (1, 3-D) mixed with chloropicrin. There are two issues affecting its use in hilly terrain in California. The first issue is the matter of control of the target pests and the second issue is the township caps. Research from California with small fruit and vegetables indicates that 1, 3-D plus chloropicrin is most effective when applied in the drip system. Therefore, a mechanical soil injection would lead to lower efficacy and higher yield losses. The second problem is with the California township cap which is calculated based on the amount of 1, 3-D applied times an application multiplier factor, which is used to account for the different emissions using different application techniques. The adjusted total application (ATP) in California is calculated using an application factor (AF) of 1.16 for 1, 3-D in a drip application system[1]. The application factor for 1, 3-D using mechanical soil injection is 2.3 (when applied less than 18 inches deep). Therefore, converting from a drip application system to mechanical soil injection has a two-fold increase in the adjusted total application calculation and means that only one half as much 1, 3-D can be used if the township is near its cap. In addition, mechanical injection applications are less effective at controlling pests under California conditions.

[1] Recommended Permit Conditions for Using 1,3-Dichloropropene Pesticides (Fumigant) Available at http://www.cdpr.ca.gov/docs/enfcmpli/penfltrs/penf2002/2002atch/attach37.pdf.

MBTOC QUESTION

2. Please discuss the potential for using reduced dosage of 1,3-D + Pic + VIF and/or solarization as an alternative to MB?

US RESPONSE

Large scale field trials in the U.S. have not demonstrated a reduction in emissions when using high barrier or VIF films. During the U.S.-MBTOC bilateral in Prague on this matter, we understood from some members of MBTOC it did not have field trial data on emissions comparing VIF to other types of film. The permeability of films under laboratory conditions has been tested. However, under field conditions emission rates do not appear to be reduced. If MBTOC is aware of such information the U.S. would greatly appreciate receiving the references so that it may be evaluated.

Solarization was addressed in Table 13.1: Reason for Alternatives Not Being Feasible of the nomination documents. The CUE for California is for tomatoes grown in the coastal areas,

where mild weather conditions (15 - 25°C temperatures) prevail. These weather conditions restrict soil solarization as alternative to methyl bromide. The CUE for Michigan is for a northern state with cold weather conditions and therefore it is not a viable option. The CUE for the southeastern U.S. lists nutsedge control a a primary consideration, solarization is unlikely to be technically feasible as a methyl bromide alternative. Research indicates that the lethal temperature for nutsedge tubers is 50^{o}C or higher (Chase et al. 1999). While this may be achieved for some portion of the autumn cropping in southern growing regions, it is very unlikely for any portion of the spring crops. Trials conducted in mid-summer in Georgia resulted in maximal soil temperatures of 43^{o}C at 5 cm depth, not high enough to destroy nutsedge tubers, and tubers lodged deeper in the soil would be completely unaffected. Therefore, the addition of 1, 3 – D and chloropicrin to solarization is not a viable alternative. If MBTOC is aware of such information relevant to the circumstances of the U.S. nomination the U.S. would greatly appreciate receiving the references so that it may be evaluated.

MBTOC QUESTION

3. Combination of fumigants and herbicides are reported as a promising alternative but no clear data (total area, costs, etc.) are given. Please specify?

US RESPONSE

The nomination for the southeastern U.S. Section 17 says "A combination of 1,3 D + chloropicrin + pebulate appeared to be the best alternative in controlling key pests in tomato fields. Since pebulate herbicide is no longer available then the growers will have to substitute another herbicide for postemergence application, (such as halosulfuron, rimsulfuron or trifloxysulfuron to achieve similar pest control). Florida and Georgia state experts claim the yield losses using a combination of 1,3 D + chloropicrin + herbicides will be higher than losses reported in table 6.2 of the tomato section of the nomination because pebulate is no longer registered and other herbicides have limitations. The crop experts were unable to provide yield loss estimate without 2-3 years of field trials. The experts claim that more time is needed to evaluate various methyl bromide fumigant alternatives, mulches and herbicides systems to study their effects on tomato yields."

SOUTH-EASTERN UNITED STATES – TABLE C.1: ALTERNATIVES YIELD LOSS DATA SUMMARY

ALTERNATIVE	LIST TYPE OF PEST	RANGE OF YIELD LOSS	BEST ESTIMATE OF YIELD LOSS
1,3 D + chloropicrin + herbicide	Fungi, Nematodes and Nutsedges	1.3 – 10.1 (Chellemi *et al*., 2001)	6.2
OVERALL LOSS ESTIMATE FOR ALL ALTERNATIVES TO PESTS			**6.2%**

The nomination states that more time is needed to evaluate these potential combinations. It is not clear how the U.S. could provide clear data on a technique that is being developed. If MBTOC could describe how other countries are quantifying cropping areas and costs of techniques that are under development the U.S. would greatly appreciate receiving the

information and any references so that it may be evaluated in the context of the US nomination.

MBTOC QUESTION

4. VIF testing goes back to 2003. Is the final data available yet? What are the constraints to much wider use of VIF, combined with MB and other fumigants as 1,3-D and Pic, where applicable combined with solarization.

US RESPONSE

Large scale field trials in the U.S. have not demonstrated a reduction in emissions when using high barrier or VIF films. During the U.S.-MBTOC bilateral in Prague on this matter, some members of MBTOC stated that they did not have field trial data on emissions comparing VIF to other types of film. The permeability of films under laboratory conditions has been tested. However, under field conditions emission rates do not appear to be reduced. If MBTOC is aware of such information the U.S. would greatly appreciate receiving the references so that it may be evaluated. Please see the response to question 2 above.

US TURF

MBTOC reference: OzL./MBTOC-CUN/USA/MS/gao

MBTOC QUESTION

1. The CUN notes that primary MB alternatives for sod production are metham sodium and dazomet, often in combination with chloropicrin and in some cases, depending on pests, 1,3-D (CUN page 7). The CUN also states that "dazomet and metham sodium with chloropicrin have looked as good (statistically) and nearly as good (numerically) in control of nutsedge and weedy grasses as MB at the high use rates for turf (560 kg/ha) (e.g. Unruh and Brecke, 2001; Unruh et al., 2002)" (page 9). It is noted that barrier sheets can also increase the efficacy of metham. The CUN states in several places it is unable to determine yield or quality loss resulting from alternatives "since research shows variability even among MB treatments, depending on location of trials and pest type" (page 13). However, the BUNI takes account only of dazomet (alone). It would be appropriate to revise the BUNI to take account of the leading alternatives for this sector.

US RESPONSE

In the technical and economic assessment of alternatives for turfgrass both dazomet and metam sodium were considered to be the alternative that most users would select. Therefore, the economic assessment was conducted assuming both dazomet and metam sodium would provide similar yield and quality impacts and that the economic impacts could be accurately portrayed using dazomet. The minor differences in dazomet and metam sodium supplanted the need for a separate metam sodium economic analysis, therefore the BUNI takes account of only the marginal strategy that might be implemented and in this case either dazomet or metam sodium would suffice and yield similar results.

MBTOC QUESTION

2. The use of improved application methods for metham and dazomet are important, as noted in the CUN. Improved equipment for the application of dazomet for turf. Improved equipment for more uniform distribution of metham sodium is being used in Europe, South America and Africa (eg. rotating-spading injection equipment); and for dazomet in Europe. Has similar equipment that provides a uniform distribution in soil, been examined or used in the USA for turfgrass?

US RESPONSE

Agricultural operations in the U.S. have tested a wide range of application equipment for use with metam and potassium sodium over the last 50 years. The testing of application equipment for dazomet due to its more recent registration is much more recent and limited in scope. For example rotating-spading injection equipment has been used with metam sodium for decades in the U.S. The U.S. is not aware of any large scale side by side comparisons of new versus old application or U.S. versus other countries application equipment to determine the uniformity of application.

MBTOC QUESTION

3. For each state (California, Florida, Georgia, Alabama and Texas) please specify the key target pest species for which alternatives are considered not available, and the precise reasons for the CUN.

US RESPONSE

That information is presented in Table 10.1: Sod—Key Pests and Reason for Methyl Bromide Request. That pest list includes weeds such as**:** nutsedge (*Cyperus* spp.); mainly off-type perennial grasses, crabgrass (*Digitaria spp*.); goosegrass (*Eleusine indica*); common bermudagrass (*Cynodon dactylon*) and turfgrass from the previous crop cycle, over 15 genera of parasitic nematodes, such as lance nematodes (*Hoplolaimus spp.*) and sting nematodes (*Belonolaimus longicaudatus*) and insects such as**:** white grubs (several species of soil-inhabiting scarabaeid beetle larvae. All of these pests are widely distributed in these sod producing states. The reasons that the alternatives are not feasible are stated in Table 13.1: Sod—Reason for Alternatives Not Being Feasible. If MBTOC could describe in more detail how to more fully elucidate the pest list and the lack of feasibility, the U.S. could attempt to further describe the situation in turfgrass production.

The nomination is for establishing new sod fields and as a pre-plant fumigation when pest pressures become so severe that effective pest management with alternatives is particularly difficult. The U. S. nomination is only for those areas where the alternatives are not effective against key pests when pressure is moderate to high. The use of MB is also considered critical only where alternatives are not suitable because of regulatory, economic, or technical constraints.

MBTOC QUESTION

4. Table 14.1: The section pre or post emergent herbicides refers the reader to item 13. However, Item 13 does not appear to provide any discussion on herbicides. Please provide information about pre and post emergent about herbicides.

US RESPONSE

MBTOC is correct the U.S. did not include herbicides in Table 13 and this should have been clearly stated. Because of the wide range of weeds, nematodes, and insects in the key pest list herbicides can address only part of the problem facing sod growers.

Preemergence herbicides must be effective for control of nutsedge (*Cyperus* spp.), off-type perennial grasses, crabgrass (*Digitaria spp*.), goosegrass (*Eleusine indica*), common bermudagrass (*Cynodon dactylon*), and turfgrass from the previous crop cycle. Oxadiazon is registered for preemergence use in newly sprigged bermudagrass and will control crabgrass and goosegrass but not nutsedge, off-type perennial grasses, or turfgrass from the previous crop cycle. Siduron is registered for preemergence use in newly seeded cool season grasses

for control of crabgrass but not nutsedge, goosegrass, off-type perennial grasses, or turfgrass from the previous crop cycle.

Post emergence herbicides must control nutsedge (*Cyperus* spp.); off-type perennial grasses, crabgrass (*Digitaria spp*.), goosegrass (*Eleusine indica*), common bermudagrass (*Cynodon dactylon*), and turfgrass from the previous crop cycle. There are several postemergence herbicides available for use on established turfgrass but they are not commonly used on turfgrass for sod production because of phytotoxicity and reduction in rooting when the sod is lifted and planted.

CERTIFIED SOD

MBTOC QUESTION

5. Do the sod certification standards in the main CUN states (California, Florida, Georgia, Alabama and Texas) specifically require MB fumigation as a condition of certification? If the certification standards for these states have not been sent to MBTOC previously, please provide copies.

US RESPONSE

In the southern States of Florida, Georgia, Alabama and Texas, the certification standards require that the nursery material be pest free and do not specify the treatment to use in order to achieve this standard. In California, methyl bromide is one of two allowable chemical treatments. Telone II, the other allowable treatment under certain limited circumstances, is not registered for sod farming.

INDUSTRY STRUCTURE

MBTOC QUESTION

6. How many fumigation companies provide MB as a service to the turf producers in the CUN? Do the current metham sodium users apply metham themselves, or do they use a fumigation company? Approximately how many growers/turf producers are covered by this CUN?

US RESPONSE

The U.S. does not have this information and is uncertain how to develop this information. Fumigators do not hold federal licenses for these uses and there is no national database of this information. The U.S. has attempted to determine the total number of turfgrass producers in the nomination, but has not been able to verify any estimates. The U.S. nomination is for enough methyl bromide to treat 254 hectares of turfgrass. If MBTOC could describe how other countries have answered these types of questions on the number of application companies and number of growers using alternatives such as metam sodium, the U.S. could see if there are other types of information that could be provided to MBTOC.

MINIMIZING MB USE AND EMISSIONS

MBTOC QUESTION

7. This sector appears to have made little or no progress in minimizing MB use and emissions, in contrast with some other sectors/countries. The turf sector wishes to continue using MB:Pic 98:2 in 2007 (Table 8.1 page 8). The sector wants to use a high dose of MB (480 kg/ha) which is similar to the rate used in 1998 (488 kg/ha). We note that the EPA has reduced the nominated dose to 300 kg/ha. Is it technically feasible to make further reductions prior to or during 2007? If so, please provide details.

US RESPONSE

The U.S. nomination is for enough methyl bromide to treat 254 hectares. The U.S. has not been able to locate sufficient, credible, multiple year studies that indicate that a reduced rate of methyl bromide or other alternatives are both technically and economically feasible in the circumstances of the U.S. nomination. If MBTOC is aware of such information, the U.S. would greatly appreciate receiving the references so that it may be evaluated.

MBTOC QUESTION

8. Barrier films have not been adopted. The CUN mentions that the requesting consortia identified future plans for examining high density polyethylene to reduce MB emissions (page 15), however the CUN does not provide any timelines for introduction of barrier films.

US RESPONSE

The U.S. does not have information on the future adoption of barrier films at this time. Information relevant to this issue is being collected as part of the management plan that the U.S. is developing for submission to the Parties in 2006.

ECONOMIC IMPACT

MBTOC QUESTION

9. The economic assessment compares MB with dazomet only. This is surprising because research information in the CUN indicates that metham sodium + chloropicrin (+ PV tarp) is a leading alternative. Please provide economic data for this alternative combination, and all other leading combinations.

US RESPONSE

In the technical and economic assessment of alternatives for turfgrass both dazomet and metam sodium were considered to be the alternative that most users would select. Therefore, the economic assessment was conducted assuming both dazomet and metam sodium would provide similar yield and quality impacts and that the economic impacts could be accurately portrayed using dazomet. The minor differences in dazomet and metam sodium supplanted the need for a separate metam sodium economic analysis, therefore the BUNI takes account

of only the marginal strategy that might be implemented and in this case either dazomet or metam sodium would suffice and yield similar results.

MBTOC QUESTION

10. Please provide the current cost of MB (US$/ha) in 2005, and indicate expected price trends for 2007.

US RESPONSE

The information included in the nomination is the most current information that is accessible at the time of the preparation of the nomination packages. There is a time lag on survey information of approximately 2 years; therefore the price of MB for 2005 is not available. Given that demand is being restricted through the CUN process, it is not clear that the price of methyl bromide will rise. In any case, the US is not able to predict a future price for 2007.

ACTIONS TO RAPIDLY DEVELOP AND DEPLOY ALTERNATIVES

MBTOC QUESTION

11. The CUN does not provide information on what actions will be taken to rapidly develop and deploy alternatives. Please provide this information and timeline.

US RESPONSE

The U.S. does not have the information on developing and deploying alternatives in this sector. This information is required as part of the management plan in 2006 and will be reported to MBTOC as part of the next CUE request cycle.

Sod Production

Please respond to these questions for the sod production remaining in the nomination after subtractions were made for use rate and growth adjustments.

Certification Questions

MBTOC QUESTION

1. Is 100% of this nomination is for certified propagative material?

US RESPONSE

Yes.

MBTOC QUESTION

2. Is participation in the certification program mandatory or voluntary?

US RESPONSE

Mandatory by State regulation

MBTOC QUESTION

3. Are the requirements of the certification program specified in local, regional, or national regulations?

US RESPONSE

The requirements are mandated by State regulation

MBTOC QUESTION

4. Is the certification required to export the sod?

US RESPONSE

It depends on the requirements in place in the importing country and the State of origin. In California, the sod may not be shipped unless certified even if the importing country does not have any requirements.

MBTOC QUESTION

5. What are the certification standards? For example, must be free of specific pests or pathogens, must be free of all pests and pathogens, plant must be of a certain size, etc.

US RESPONSE

In the southern States of Florida, Georgia, Alabama and Texas, the certification standards require that the nursery material be pest free and do not specify the treatment to use in order to achieve this standard. In California, methyl bromide is one of two required treatments, with Telone II an available option under limited circumstances. In addition, there are industry standards that specify quality standards for off-type grasses and weeds. Although these industry standards are technically voluntary because they are not legally required, there is no market for non-certified sod and retailers will not carry the product.

MBTOC QUESTION

6. Is the use of methyl bromide mandated for certification? Is a minimum rate of methyl bromide specified?

US RESPONSE

In the southern states of Florida, Georgia, Alabama and Texas, the certification standards require that the nursery material be pest free and do not specify the treatment to use in order to achieve this standard. In California, methyl bromide is a required treatment. Methyl bromide minimum treatment rate specified by law in CA ranges from 224 kgs/hectare for sandy soils to 448 ks/hectare for clay loam soils.

MBTOC QUESTION

7. Are there soil disinfestation measures other than MB that are approved for certification either for specific growing conditions or broadly for many growing conditions? Why can't these be used in the circumstances of the nomination?

US RESPONSE

There are no other alternatives that are technically feasible to control pests in sod production. The only other alternative shown to have any efficacy for soil bourne pests (not to meet weed certification standards) is Telone II which is not registered for sod farming.

MBTOC QUESTION

8. Please provide data demonstrating that MB results in pest/pathogen-free sod.

US RESPONSE

The U.S. does not know of any studies specifically designed to examine the pest/pathogen free standard in sod. However, there are studies on the general technical efficacy of methyl bromide and alternatives in sod conducted by Brian Unruh (which have been cited in previous documents submitted to the Secretariat) demonstrate the lack of performance of the alternatives compared to methyl bromide. Some of these studies do provide data on pest populations using various combinations of alternatives.

MBTOC QUESTION

9. Please provide data showing that MB alternatives either can or cannot meet pathogen/pest-free level required for certification by providing data comparing pest/pathogen populations on propagative materials grown in 1) soil treated with methyl bromide, 2) untreated soil, 3) 1,3-D and chloropicrin alone and in combination, 4) metham sodium/dazomet, and 5) other relevant alternatives. While plant growth data are useful, they do not substitute for pest/pathogen data if the certification requirement is for pest/pathogen-free propagative material.

US RESPONSE

See answer to question 8 and Unruh study demonstrated lack of comparable performance with alternatives in sod production. Furthermore, 1,3-D is not registered for sod farming in the U.S.

MBTOC QUESTION

10. What are the consequences of not meeting the pest/pathogen-free standards? For example, sod cannot be sold, material can be sold as lower quality/lower price, propagative materials must be treated before selling to kill pest/pathogen (e.g. hot water dips, etc.), etc.

US RESPONSE

Product can not be sold or will not be carried by retailers.

MBTOC QUESTION

11. If certification isn't mandated by law or regulation, is it used as a quality standard demanded or expected in order to market the crop? Why can't MB alternatives be used to meet the quality standard?

US RESPONSE

See answers to questions 5 and 8 and Unruh study demonstrated lack of comparable performance with alternatives in sod production. Furthermore, 1,3-D is not registered for sod farming in the U.S.

MBTOC QUESTION

12. What are the consequences of not meeting the quality standard? For example, inability to sell crop, lower price for crop, etc.

US RESPONSE

See answers to questions 5 and 8 and Unruh study demonstrated lack of comparable performance with alternatives in sod production. Furthermore, 1,3-D is not registered for sod farming in the U.S.

General Questions

MBTOC QUESTION

13. The Amount of Nomination (76,112 kg) shown in Table A1 of the Executive Summary does not appear to include the 1,928 kg shown for research in the BUNI. Other U.S. CUNs have included the research amount in the amount shown in the Executive Summary table. Is the nominated amount 76,112 kg or 76,112+1,928 kg = 78,040 kg?

US RESPONSE

The amount of the U.S. nomination is 78,040 kg.

MBTOC QUESTION

14. Are halosulfuron or trifloxysulfuron registered for use to control nutsedge or other weeds in sod production? If not, will the products be registered in the future?

US RESPONSE

Neither halosulfuron nor trifloxysulfuron are registered for use in sod production. Applications are not pending with EPA to register either of these chemicals for this use. USG is not in a position to speculate as to why the registrants are not pursuing registration for this use. Decisions to pursue registration are made solely by the registrants. However, a

brief search of the internet showed that two applications of halosulfuron caused severe phytotoxicity with a 50% reduction in plant biomass.

MBTOC QUESTION

15. The rate of 48 g/m^2 of methyl bromide is higher than that required by several other certified nursery uses of methyl bromide. What circumstances of the sod production represented in this CUN require the high rate of methyl bromide? Please present data showing that lower rates are not sufficient.

US RESPONSE

The U.S. has only nominated a use rate of 300 kg ai/ha for turfgrass. In question 7 under "Minimizing MB use and Emissions" MBTOC acknowledges this by stating *"The sector wants to use a high dose of MB (480 kg/ha) which is similar to the rate used in 1998 (488 kg/ha). We note that the EPA has reduced the nominated dose to 300 kg/ha."* Therefore, the U.S. has nominated the lower use rate until the applicants can demonstrate that this lower use rate is not effective.

MBTOC QUESTION

16. Can a formulation with a higher rate of chloropicrin be used for some or all of the circumstances of this nomination, i.e., instead of 98:2, use 70:30 methyl bromide:chloropicrin?

US RESPONSE

The U.S. has not been able to locate sufficient, credible, multiple year studies that indicate that lower concentrations of methyl bromide are both technically and economically feasible in the circumstances of the U.S. nomination. If MBTOC is aware of such information the U.S. would greatly appreciate receiving the references so that it may be evaluated.

MBTOC QUESTION

17. The BUNI includes some columns not present in some of the other U.S. nominations, and not explained in the attached footnotes. Please explain what the "% adopt" under the heading "% Adopt New Fumigants" means. Please describe how the value for "% per year" under "% Adopt New Fumigants" was reached.

US RESPONSE

In the BUNI the U.S. has added two new categories this year under the heading of "% Adopt New Fumigants". The category of "% Adopt" is an estimate of the eventual market share where alternatives can replace methyl bromide for this sector based on current conditions. This estimate uses the Delphi Method to simultaneously consider current regulatory, technical, and economic parameters. The next category of "% per year" is an estimate of the

percent adoption of alternatives per year for this sector based on current conditions and again used the Delphi Method.